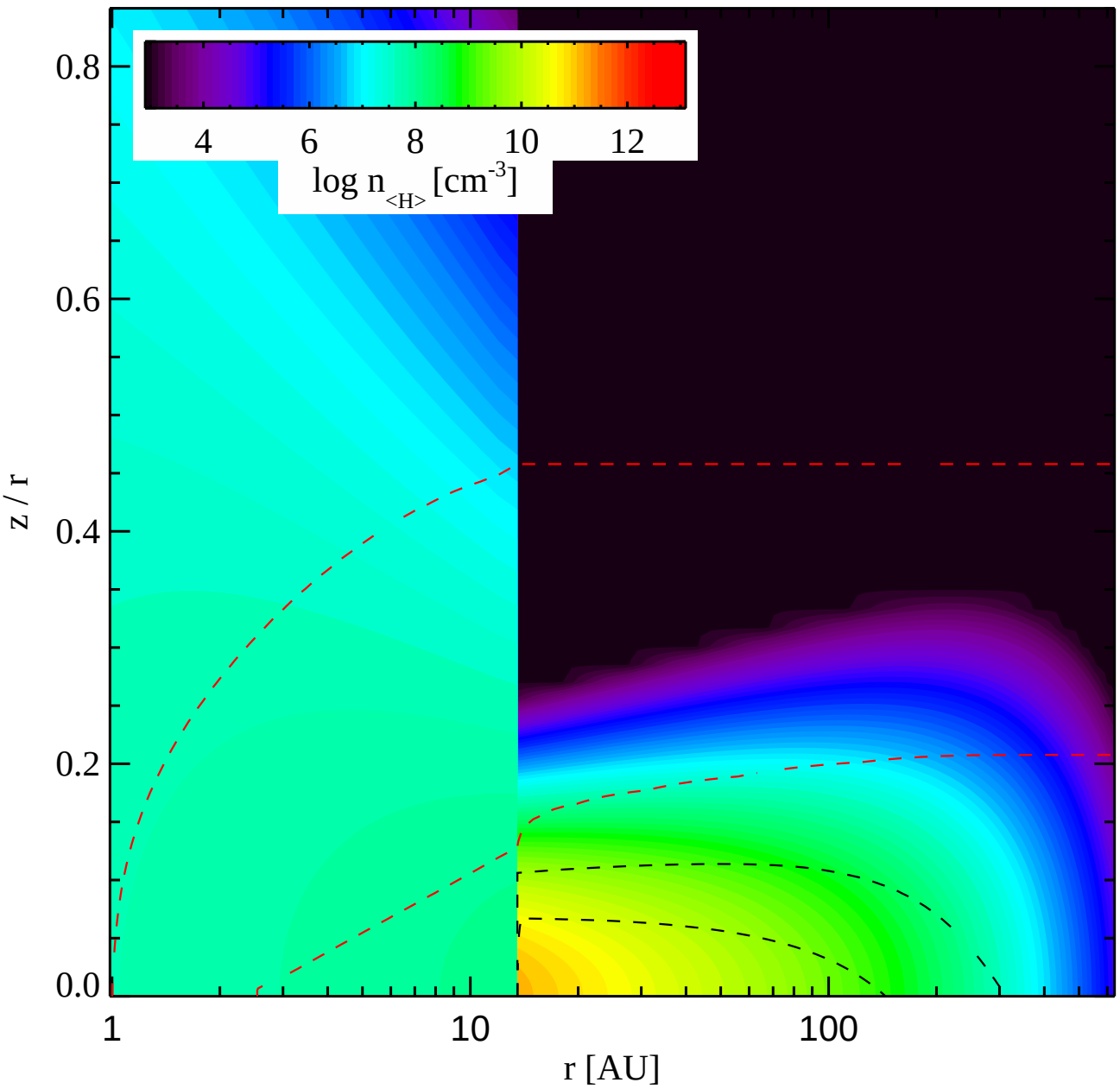
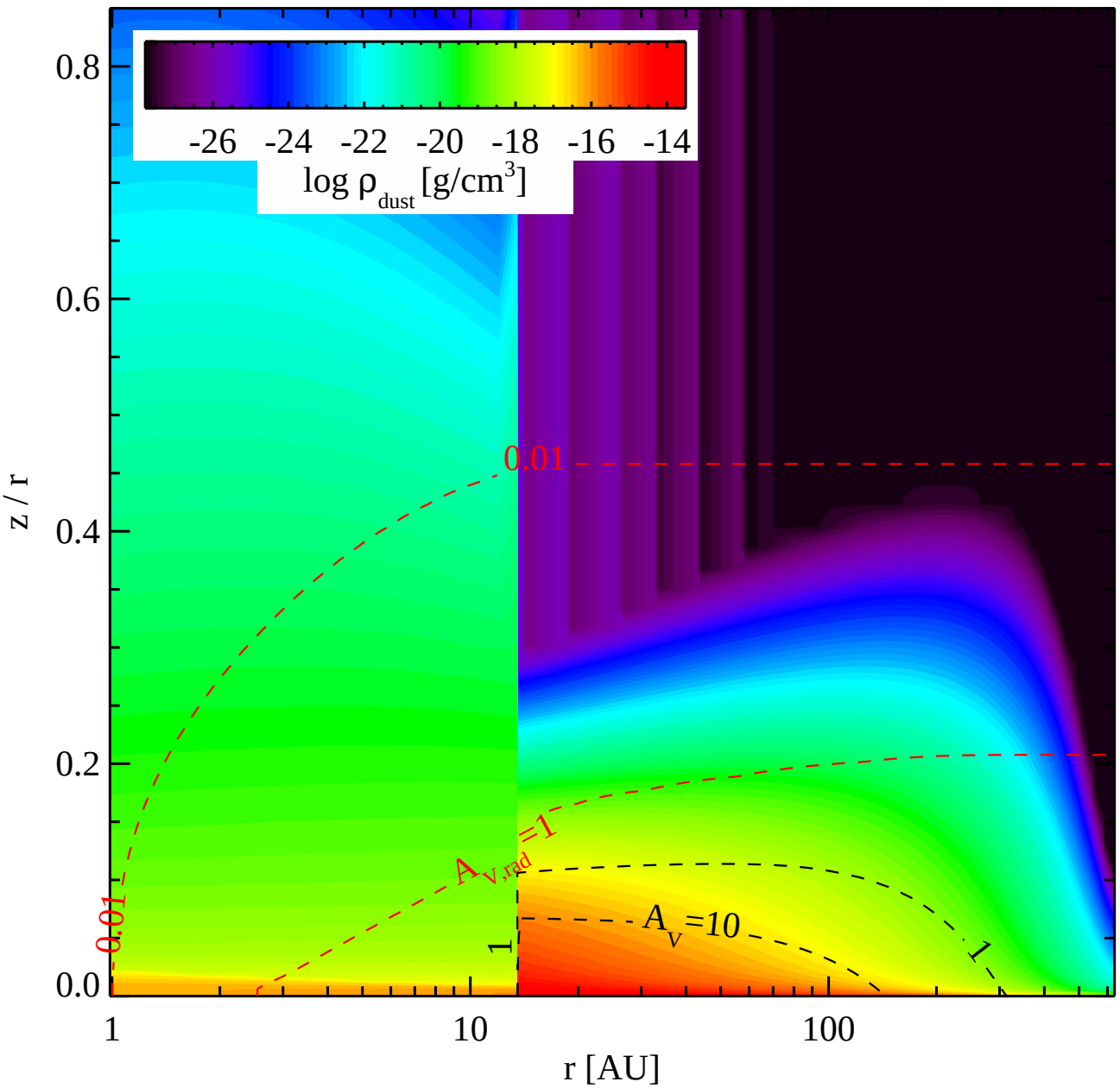
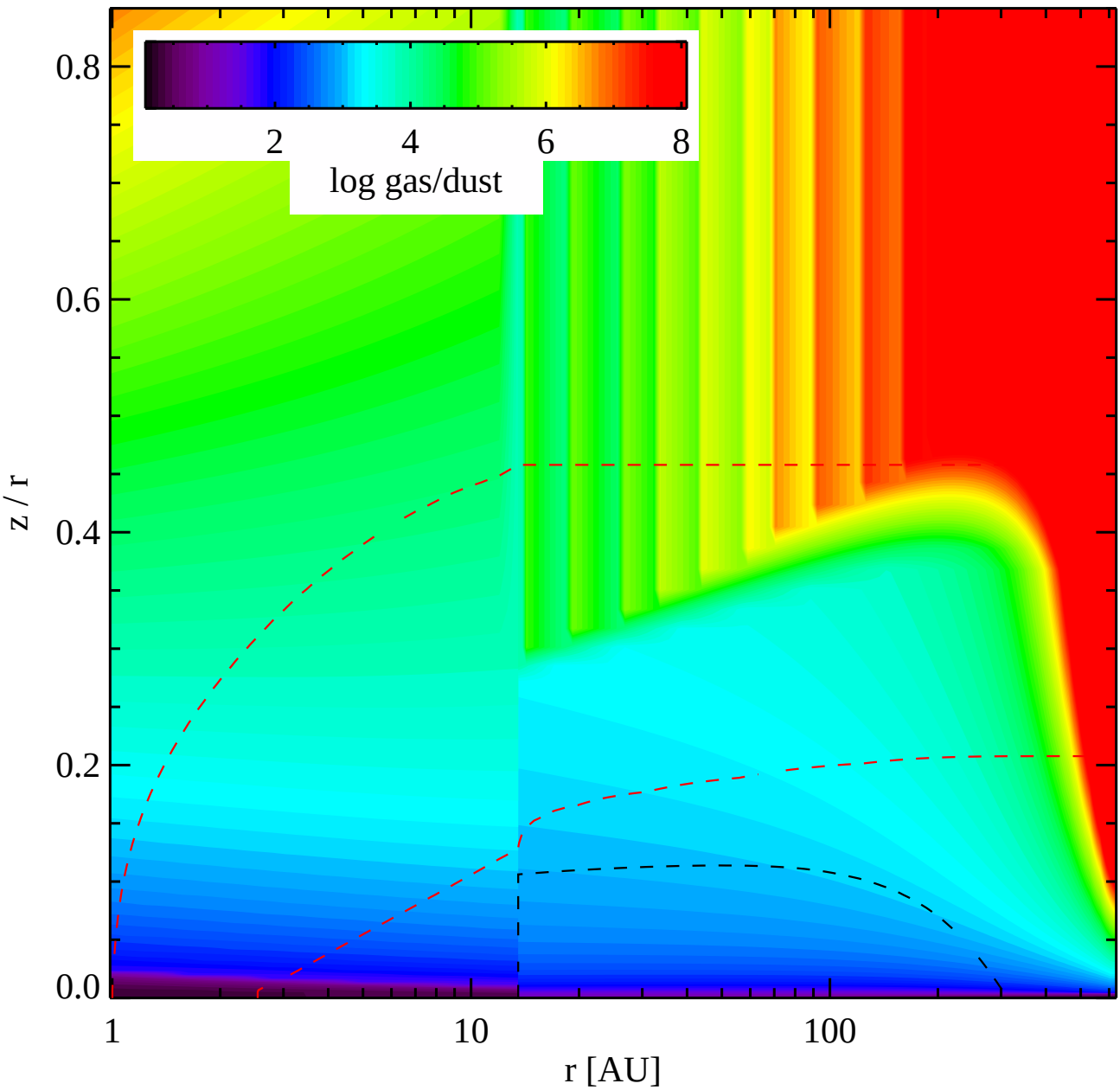
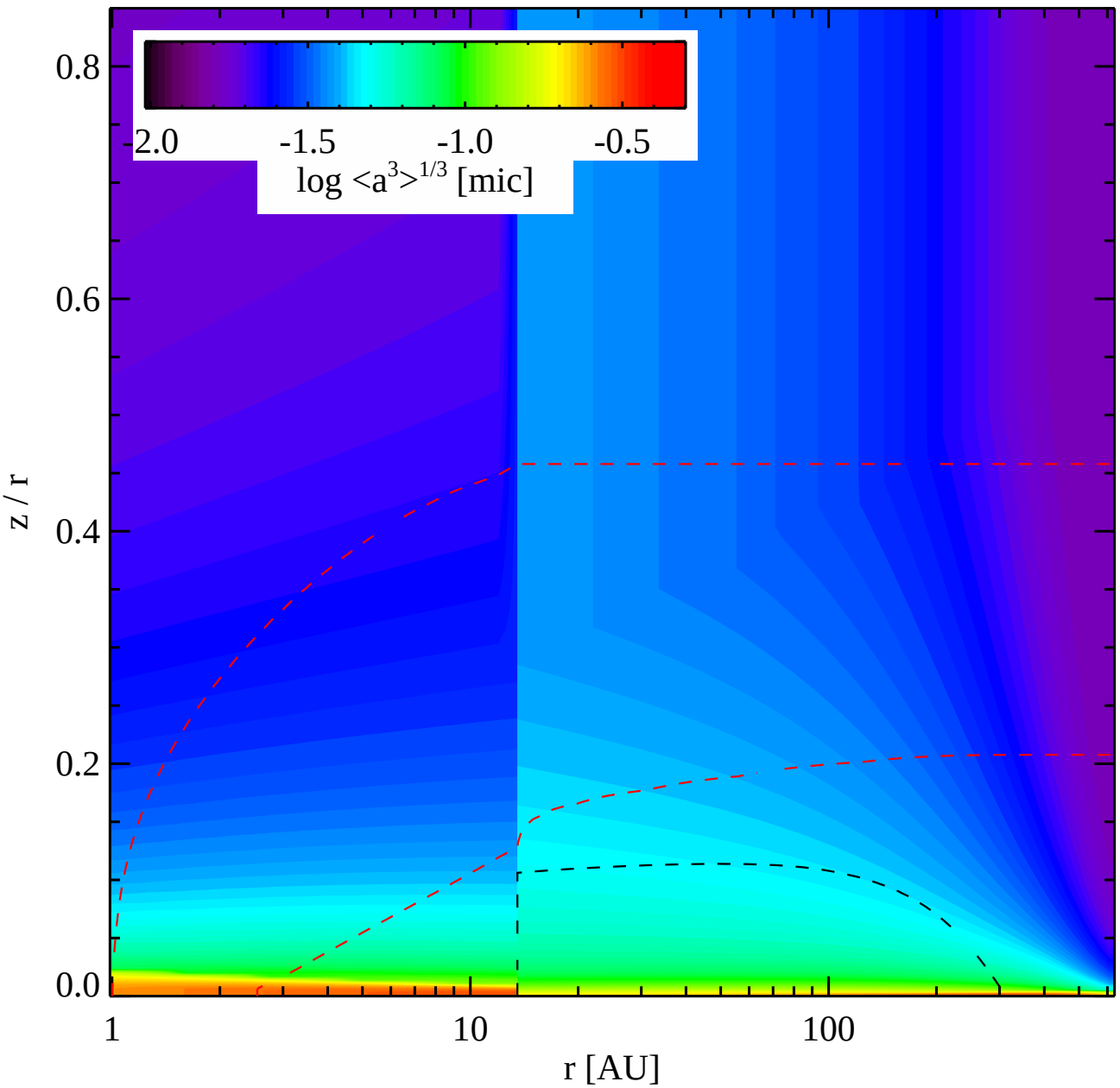
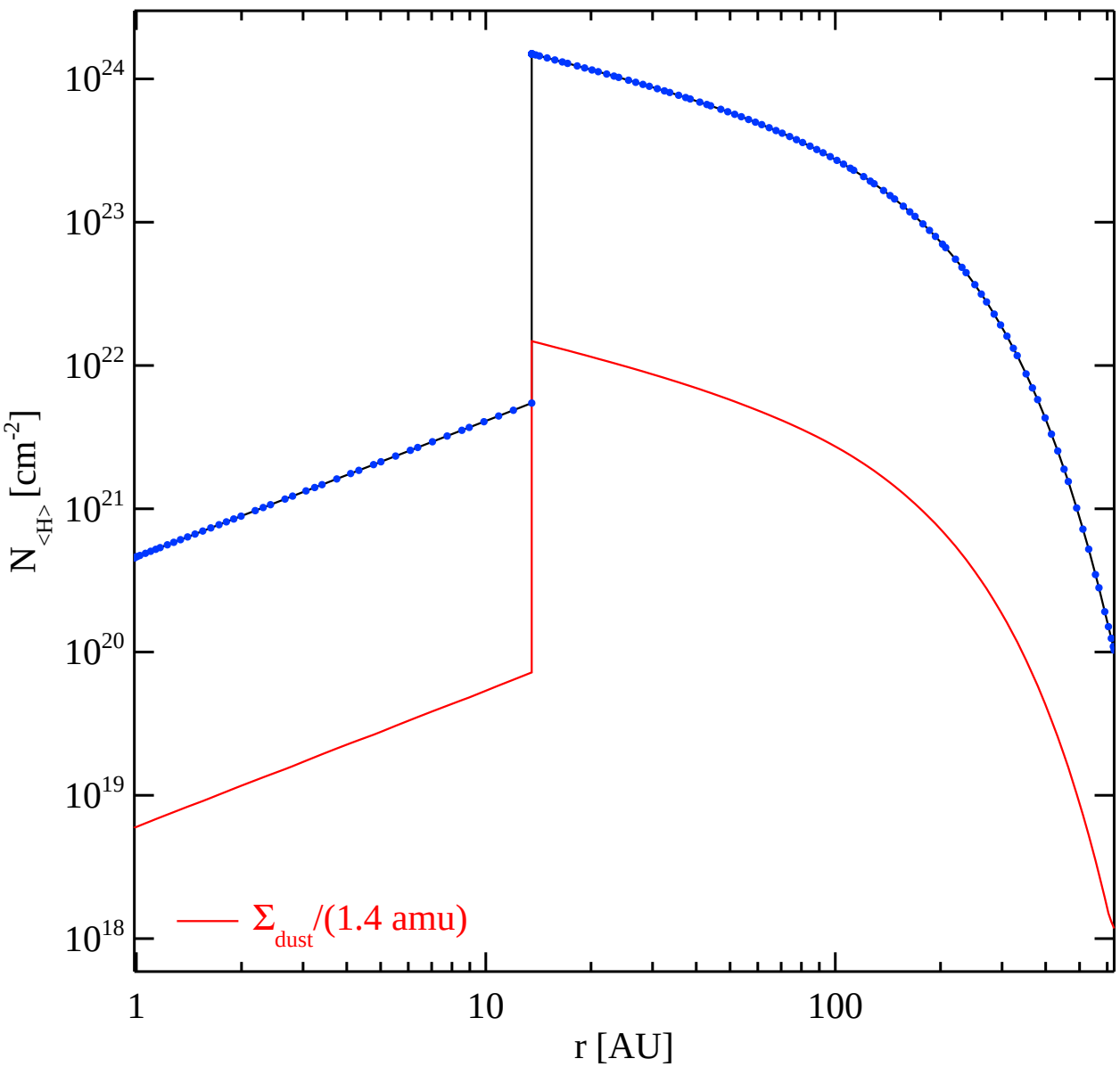
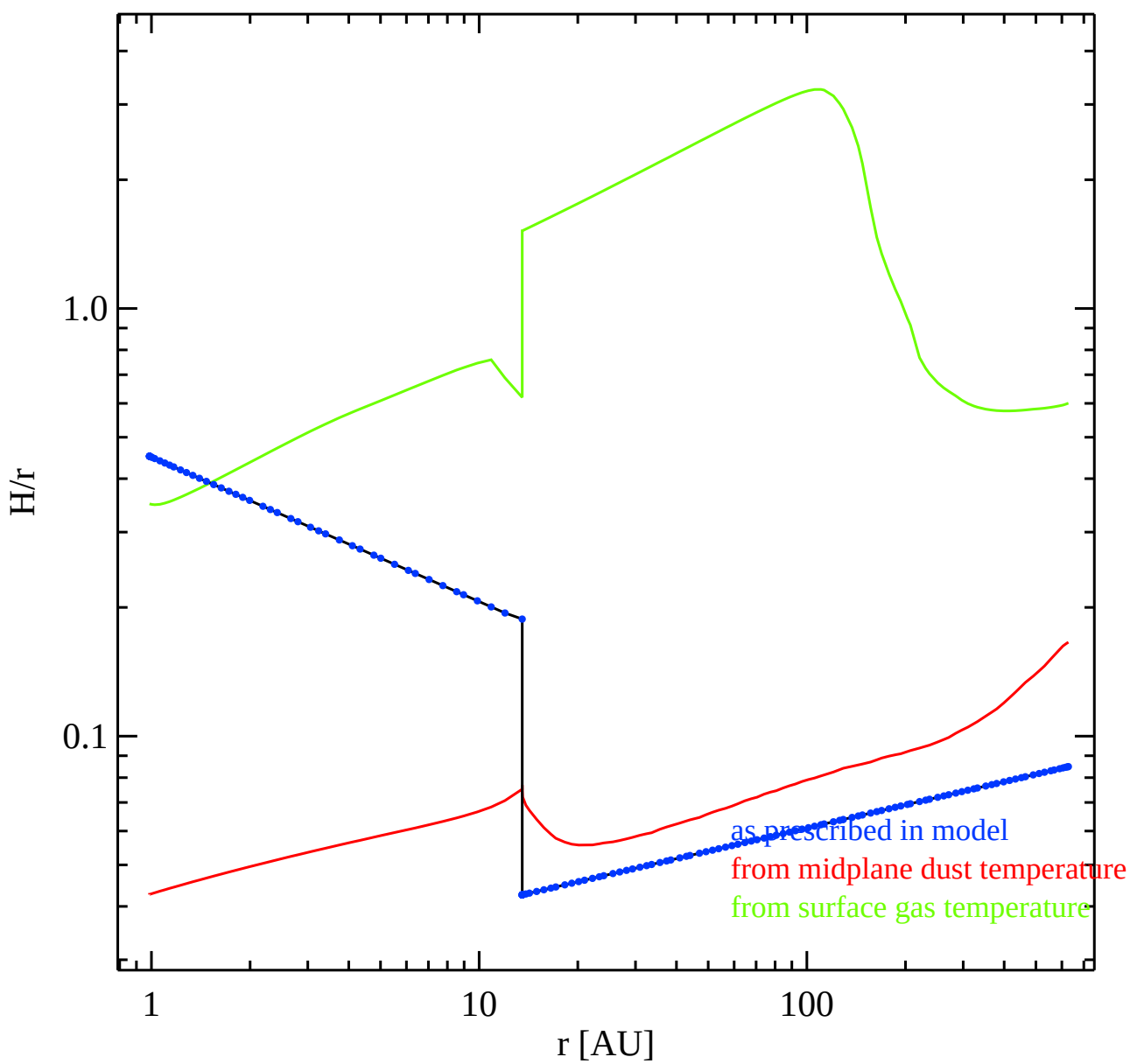

4
6
8
10
12
log n<H> [cm-3]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

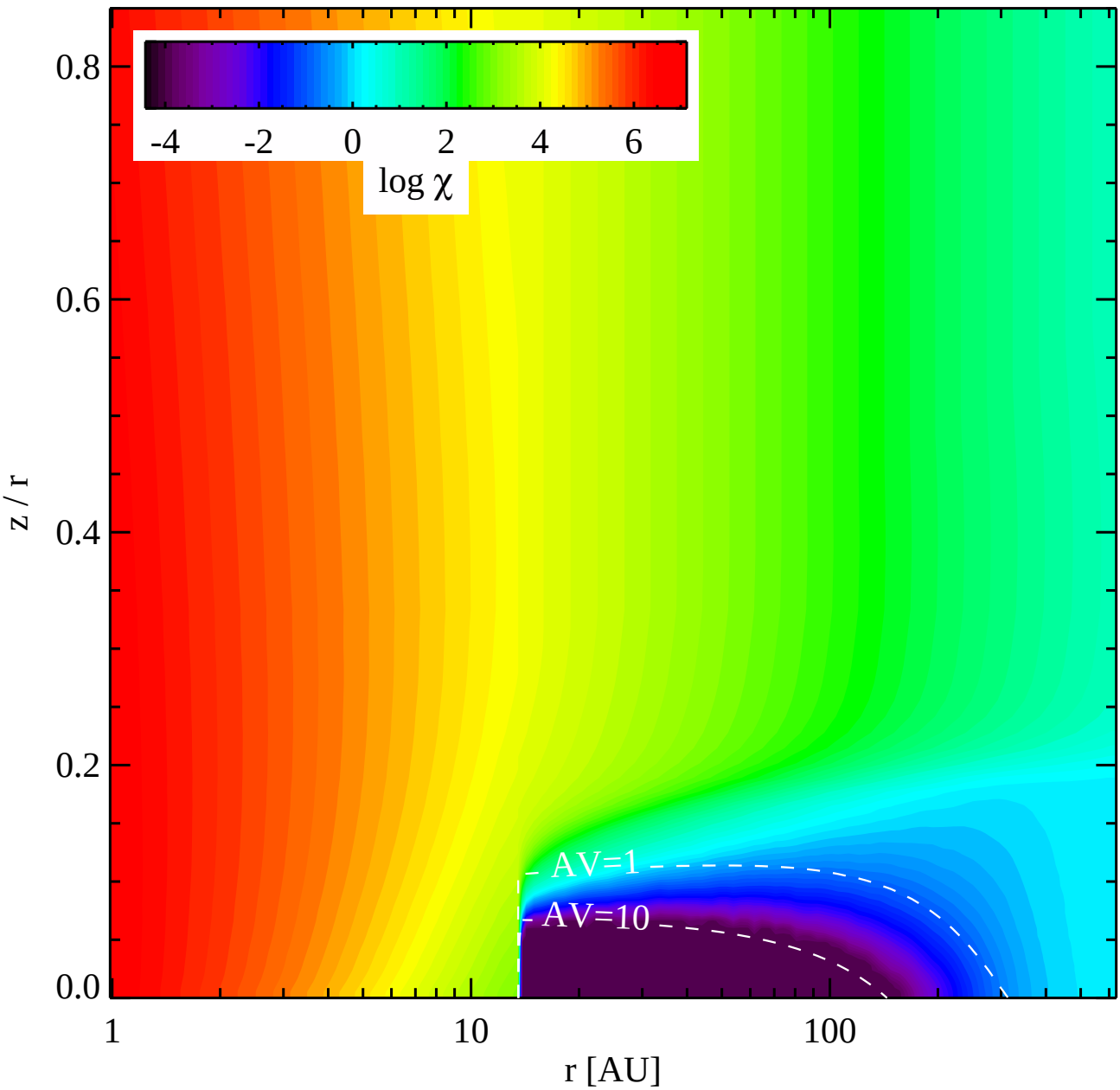

-26 -24 -22 -20 -18 -16 -14
log ρ dust [g/cm3]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
0.01
0.01
A V,rad =1
A V =10
1
1

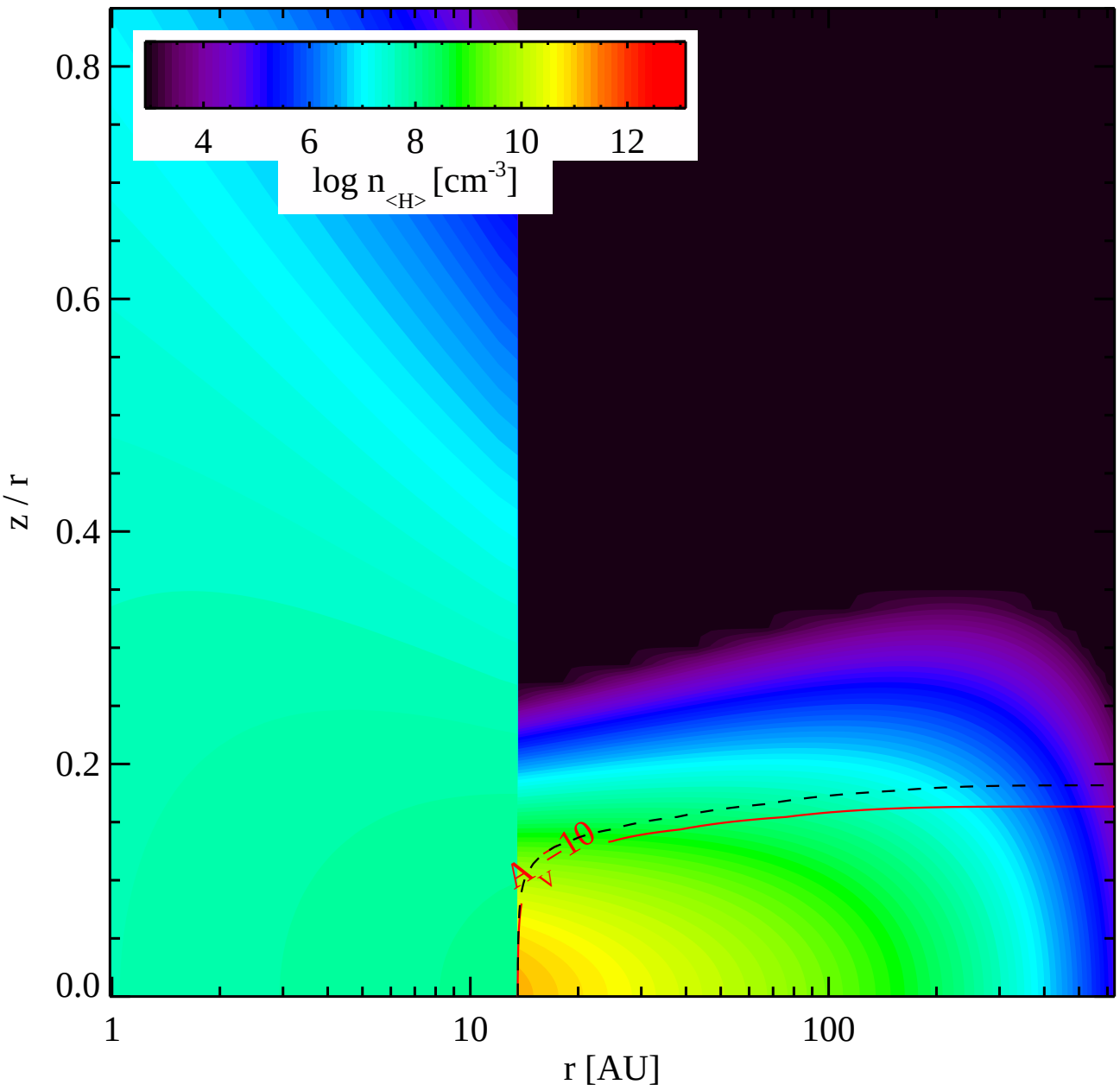

2
4
6
8
log gas/dust
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

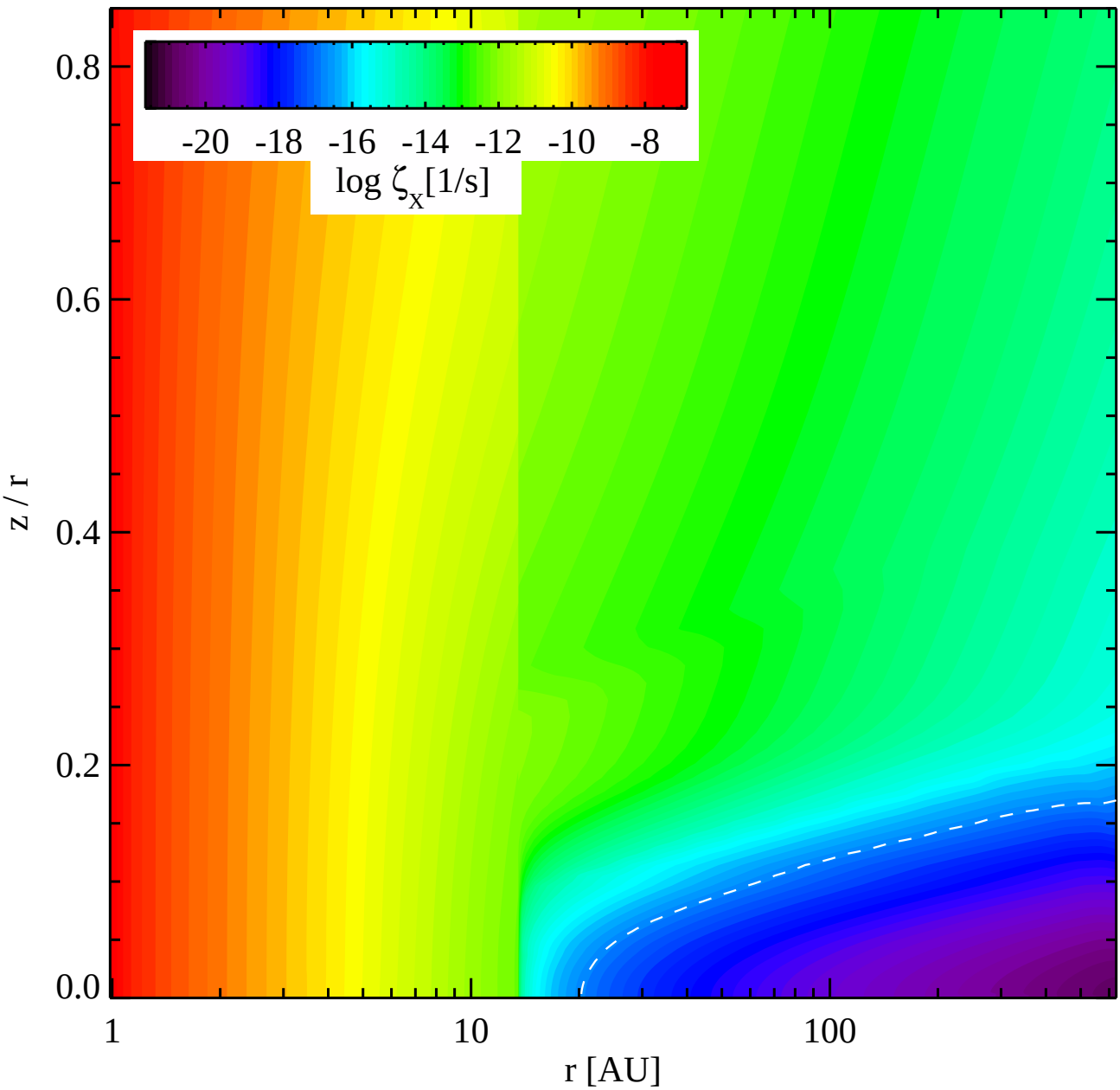

-2.0
-1.5
-1.0
-0.5
log <a^3>^1/3 [mic]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

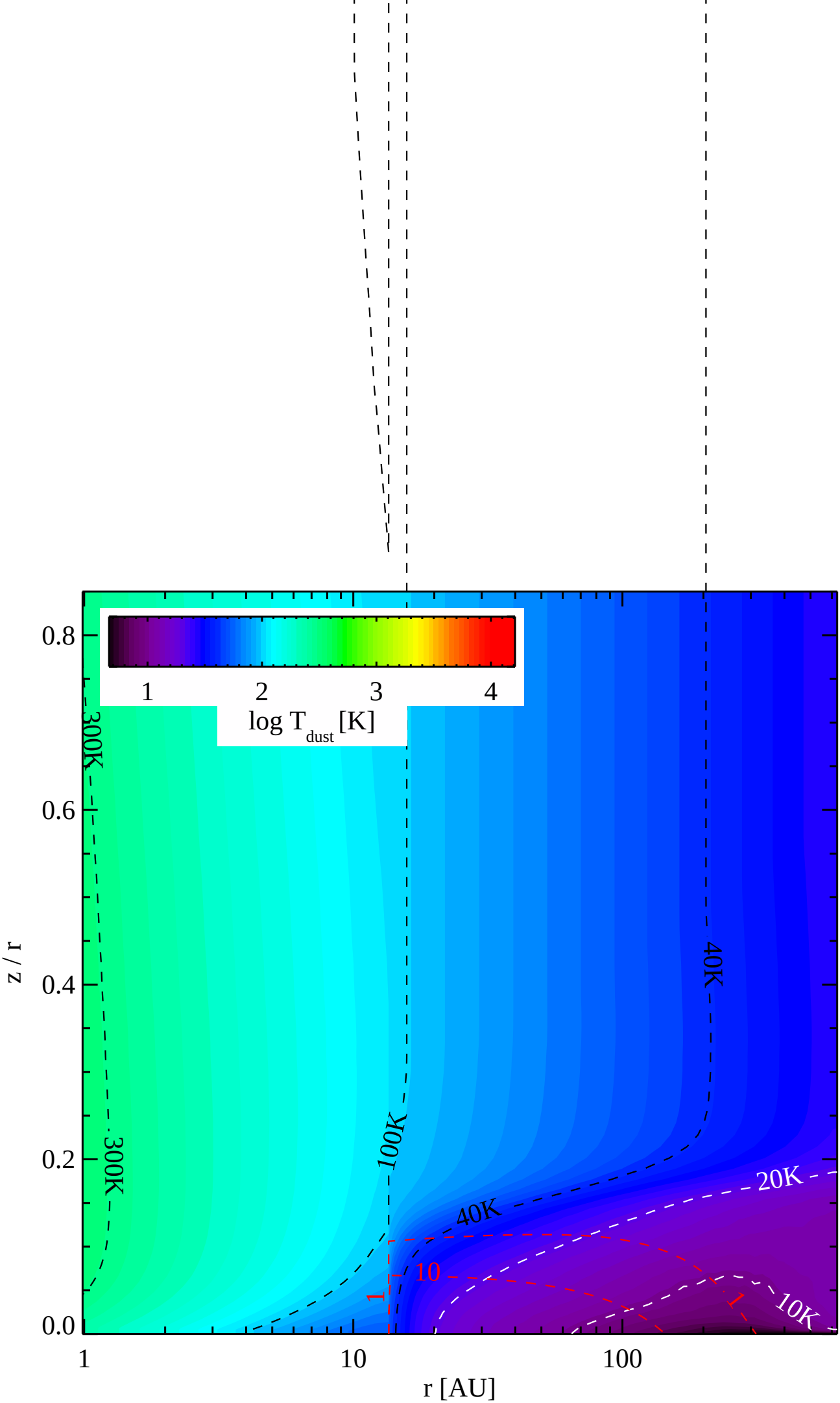

10^{24}
10^{23}
10^{22}
10^{21}
10^{20}
10^{19}
10^{18}
$N_{<H>}$ [cm^{-2}]
1
10
100
r [AU]
Σ_{dust}/(1.4 amu)

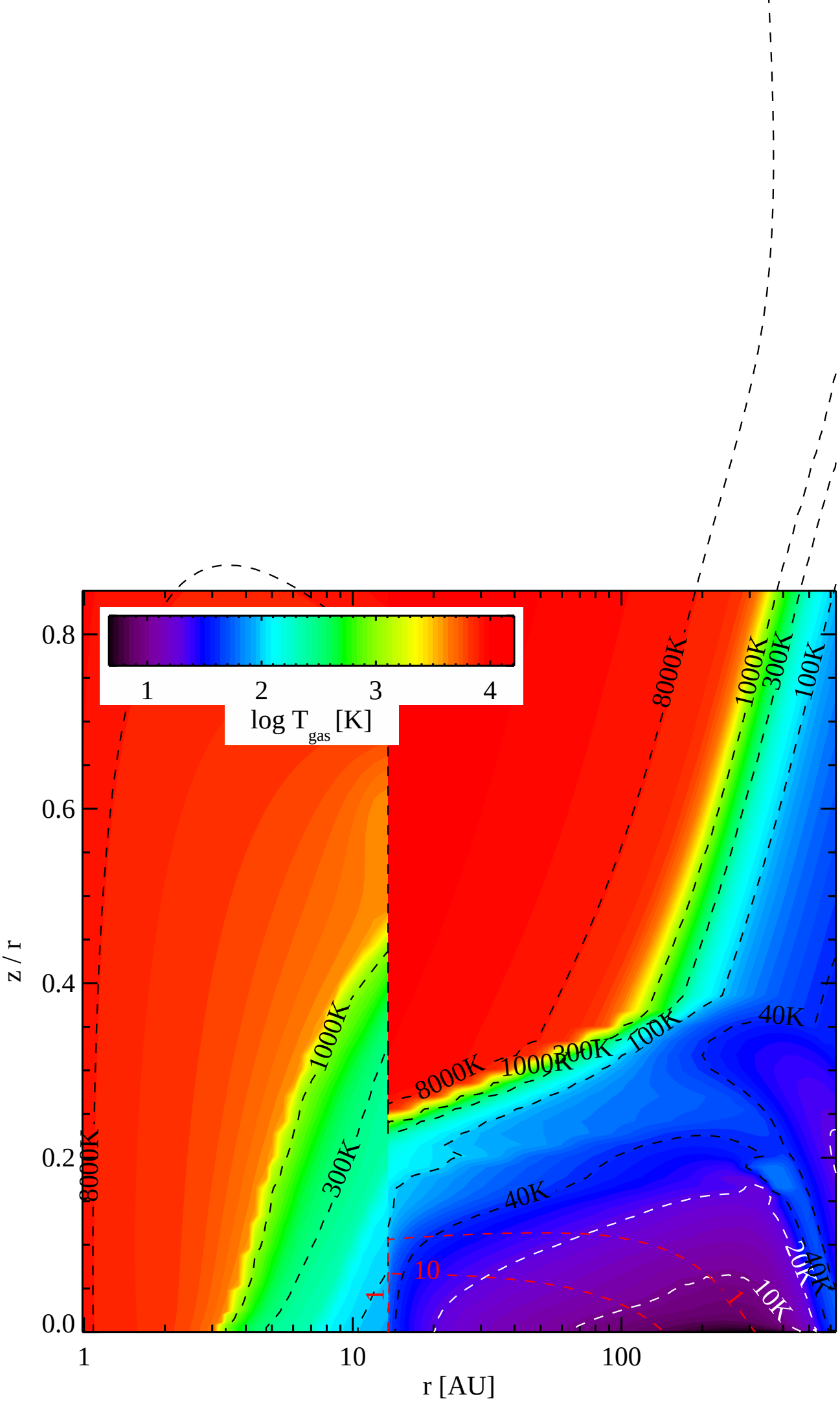

1.0
0.1
H/r
1
10
100
r [AU]
as prescribed in model
from midplane dust temperature
from surface gas temperature

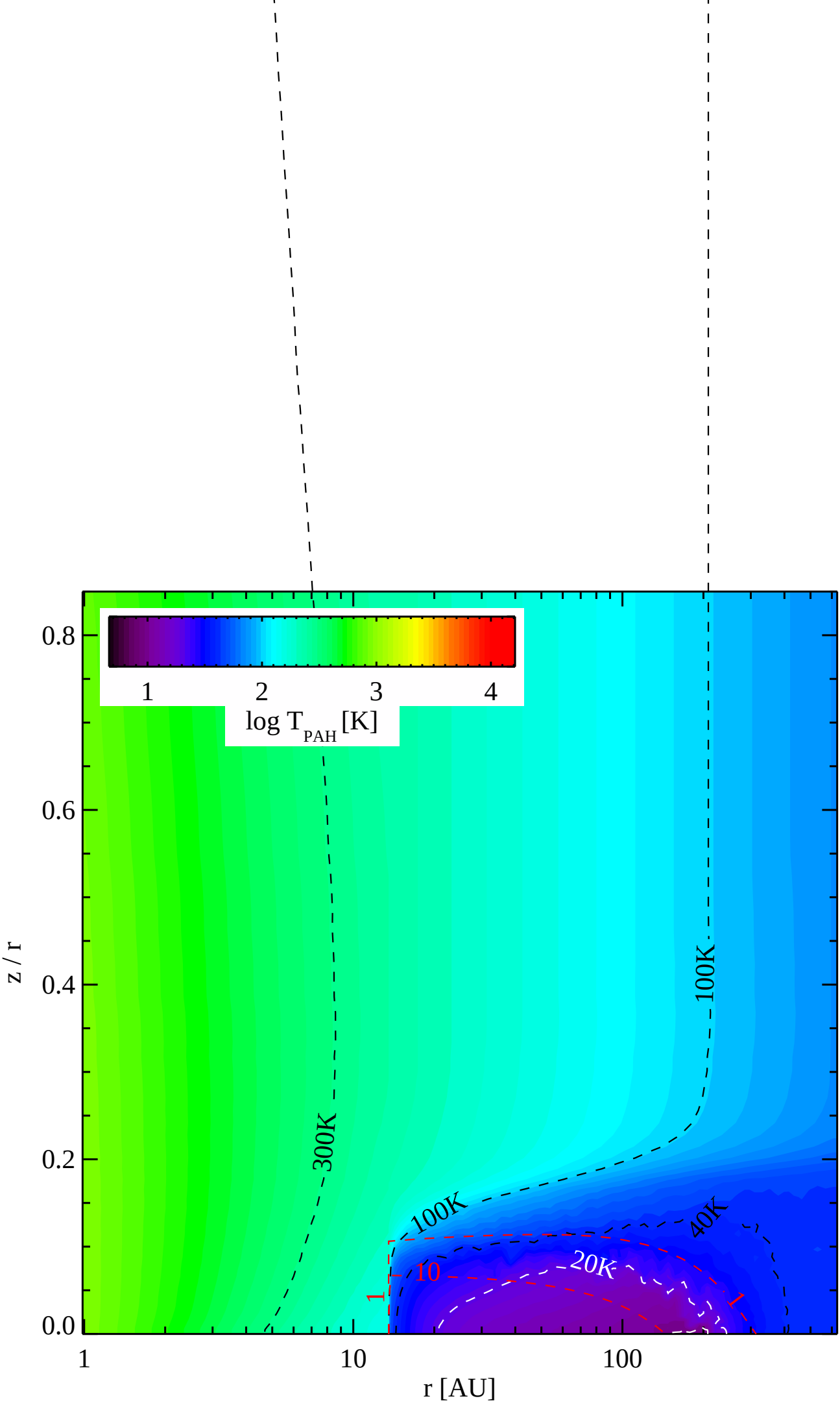

0.8
0.6
0.4
0.2
0.0
z / r
-4
-2
0
2
4
6
log χ
AV=1
AV=10
1
10
100
r [AU]

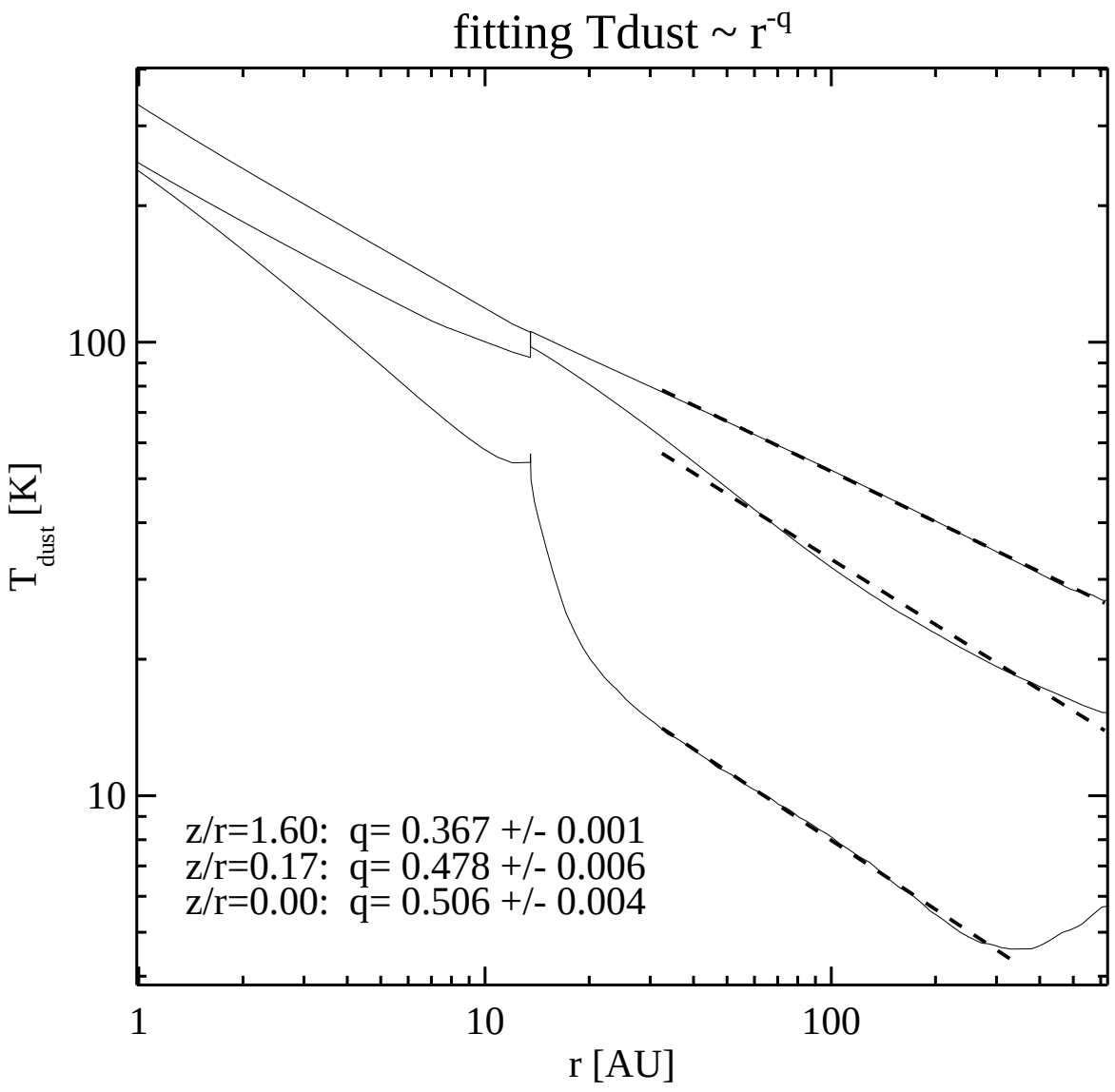

4
6
8
10
12
log n<H> [cm-3]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
AV=10

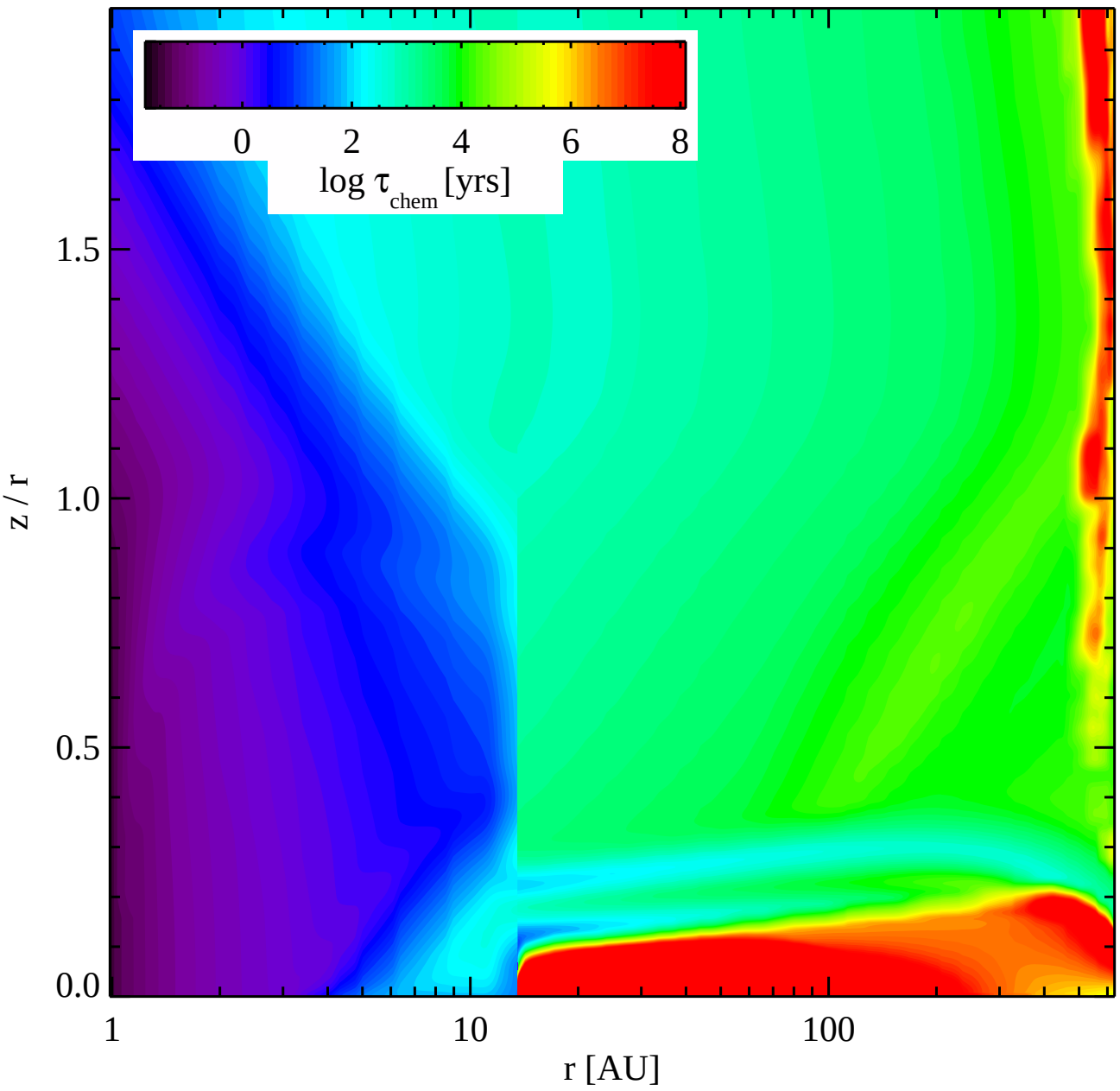

-20 -18 -16 -14 -12 -10 -8
log ζX[1/s]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

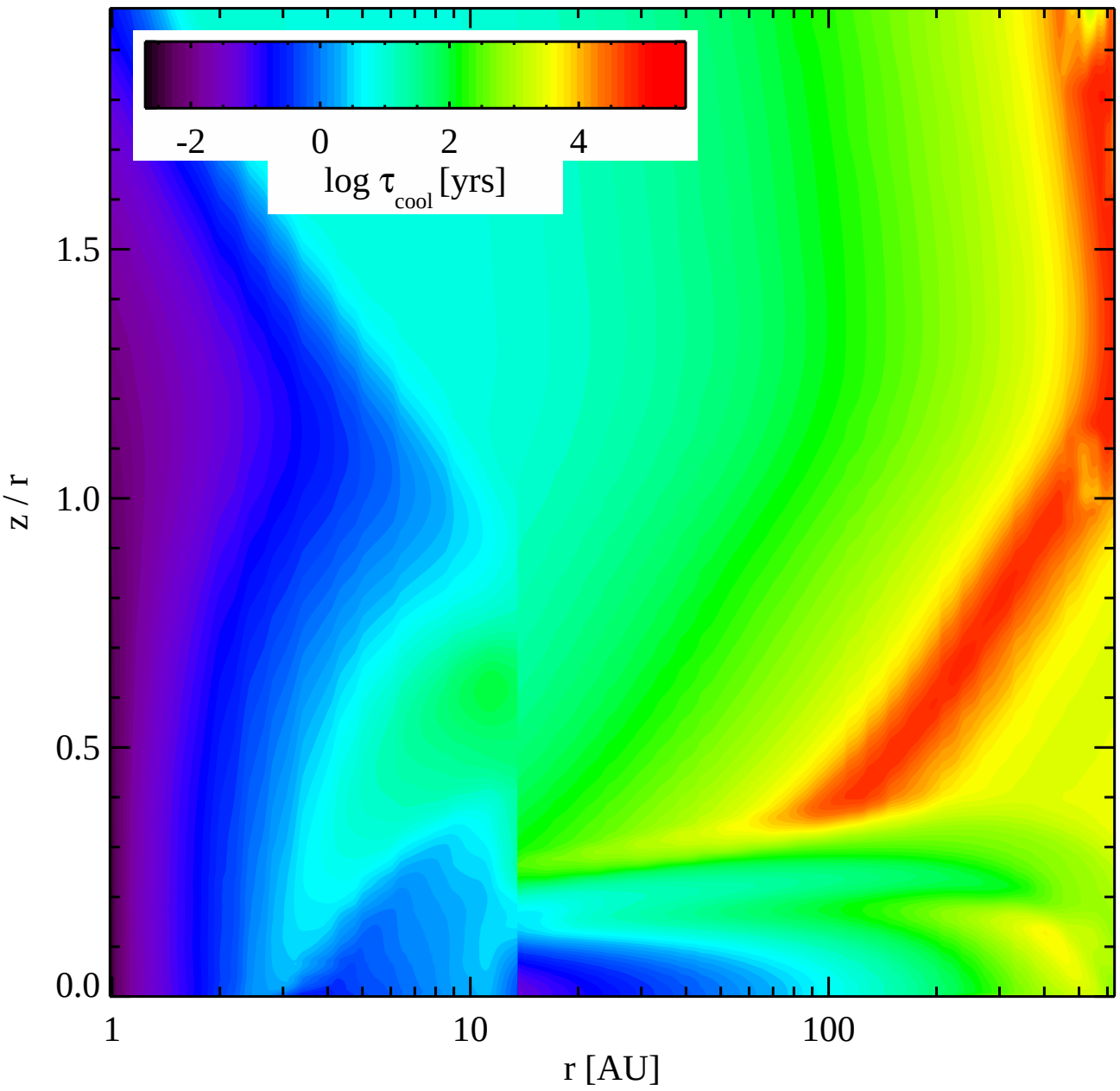

0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
1
2
3
4
log T dust [K]
300K
300K
100K
40K
40K
20K
10
1
1
10K

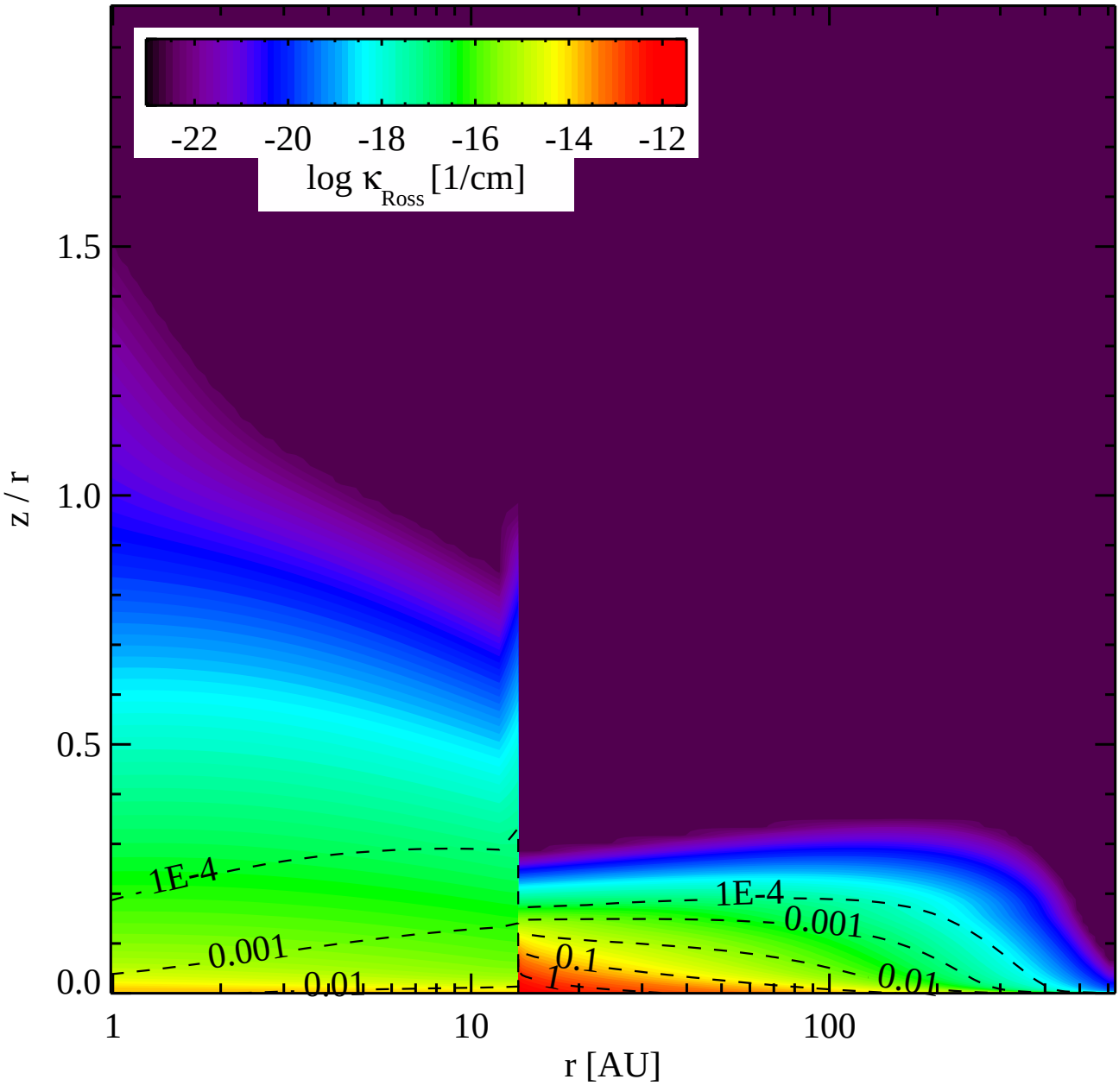

0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
1
2
3
4
log T gas [K]
8000K
1000K
300K
100K
40K
20K
10K
10

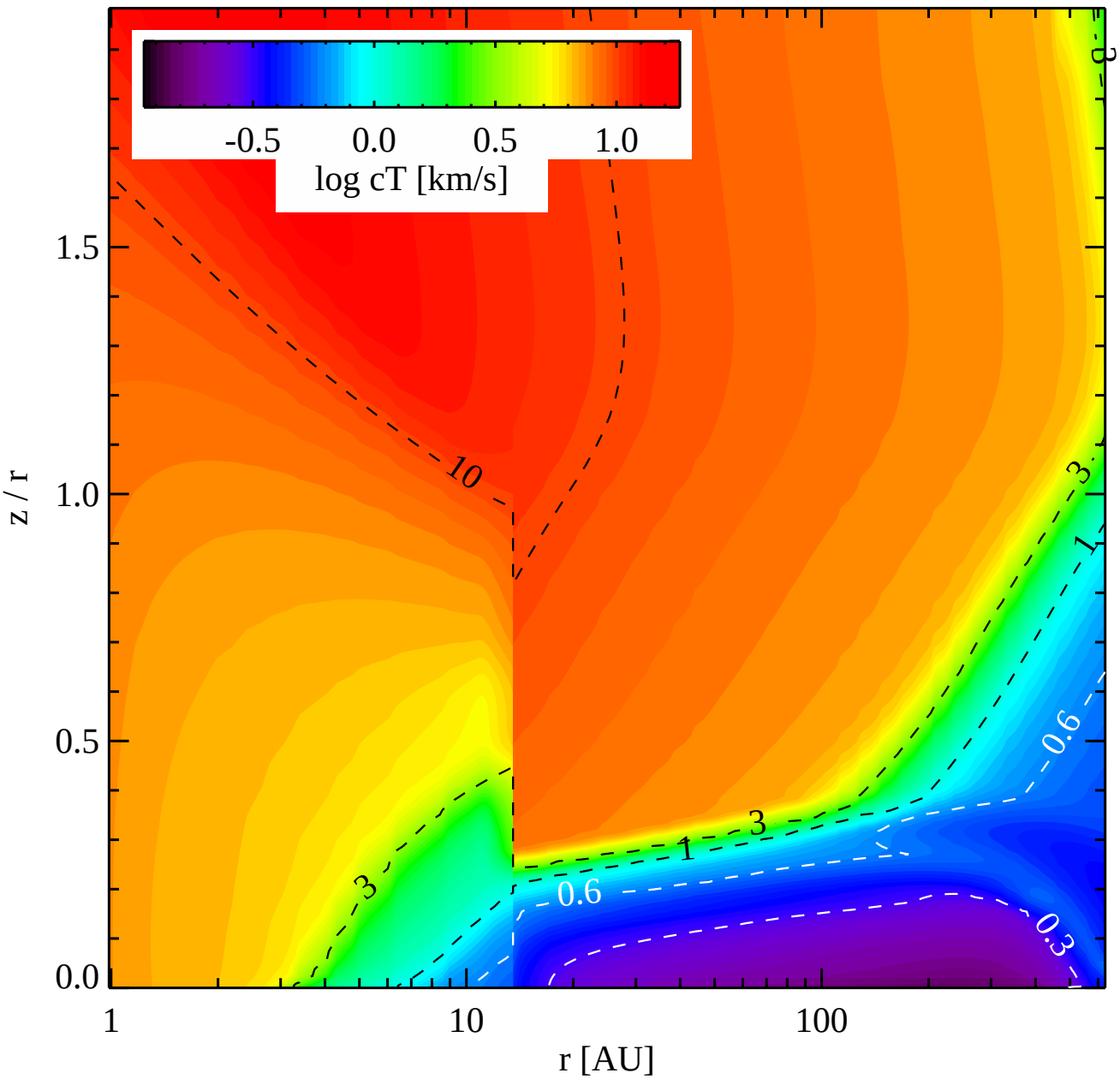

1
2
3
4
log T PAH [K]
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
300K
100K
100K
40K
20K
10
1

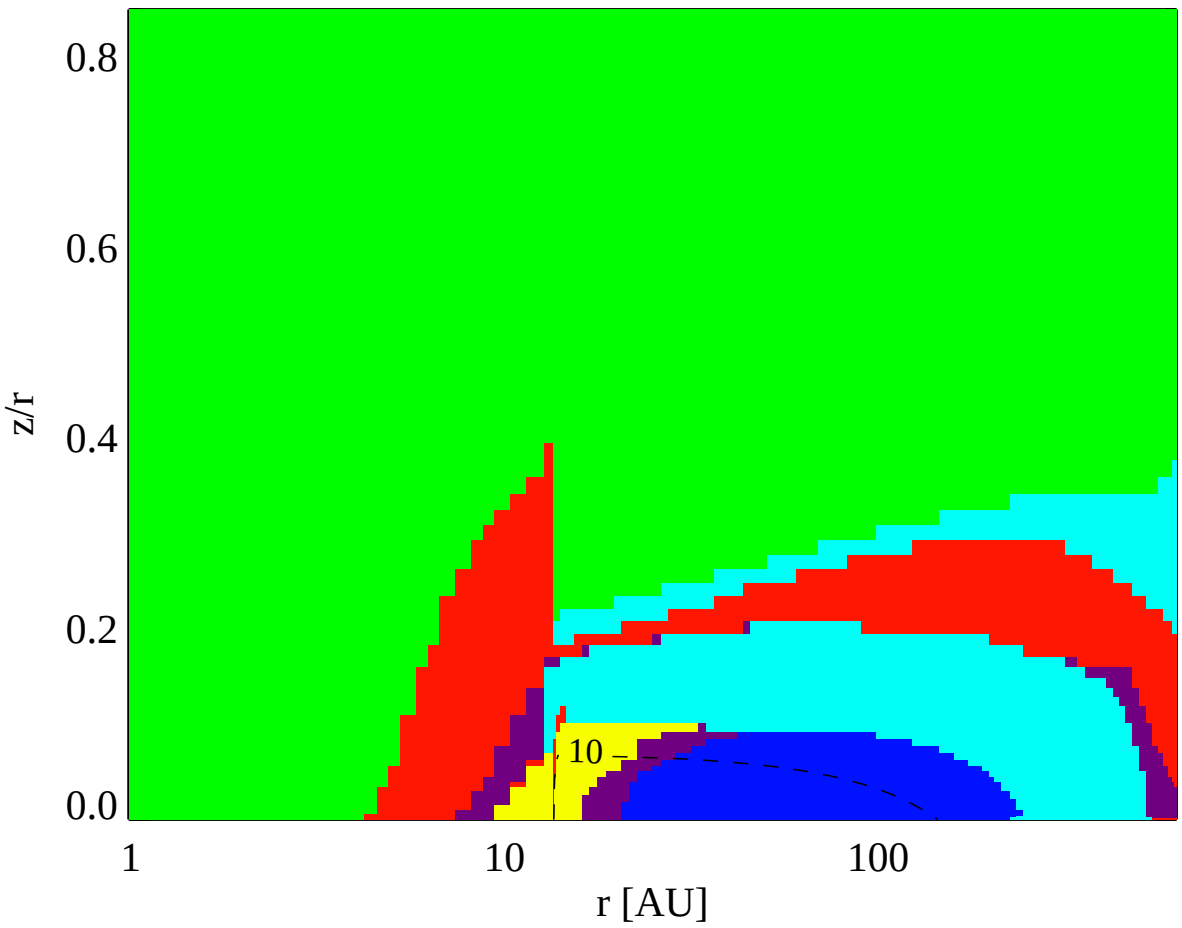

fitting Tdust ~ r^-q
100
10
T dust [K]
1
10
100
r [AU]
z/r=1.60: q= 0.367 +/- 0.001
z/r=0.17: q= 0.478 +/- 0.006
z/r=0.00: q= 0.506 +/- 0.004


0
2
4
6
8
log τ chem [yrs]
1.5
1.0
0.5
0.0
z / r
1
10
100
r [AU]

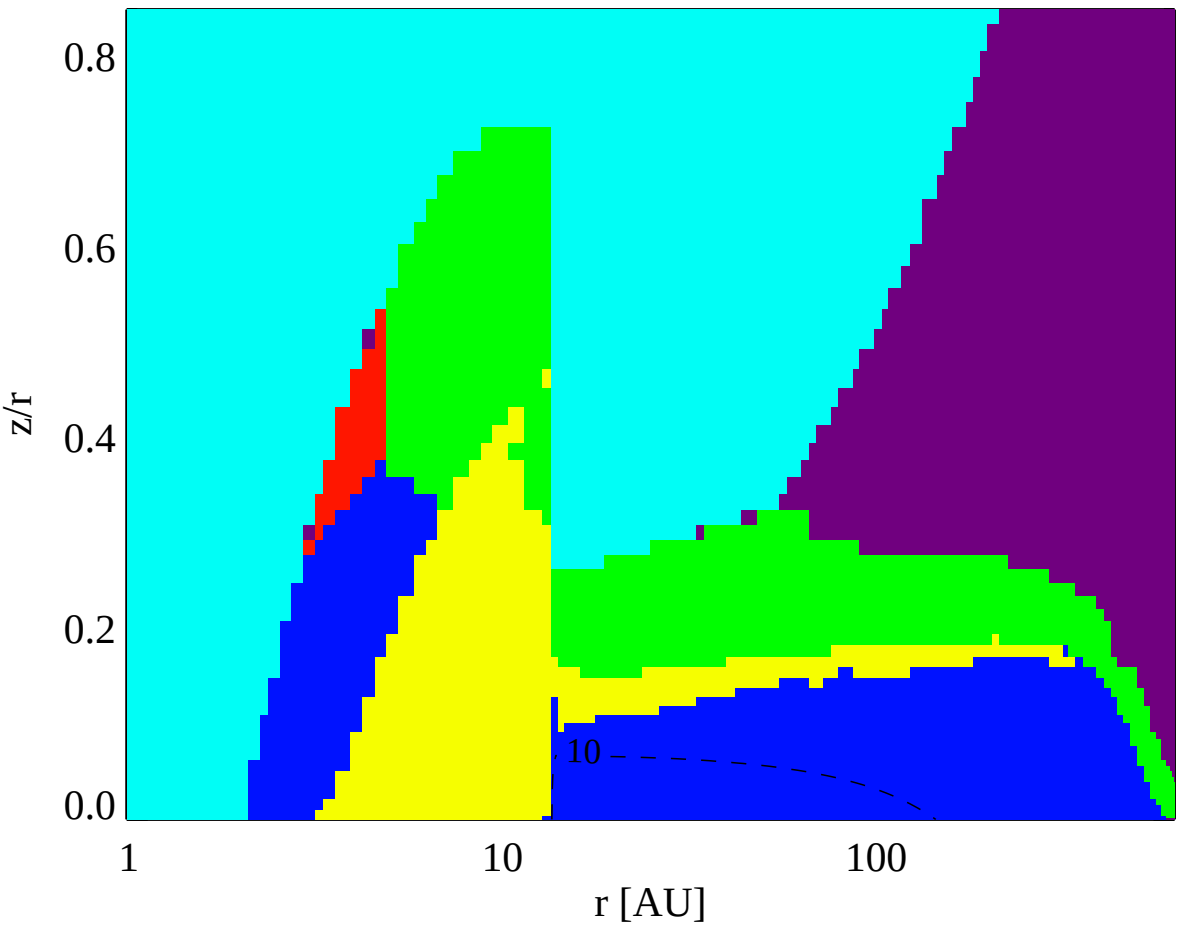

-2
0
2
4
log τ cool [yrs]
z / r
0.0
0.5
1.0
1.5
1
10
100
r [AU]


-22
-20
-18
-16
-14
-12
log κ Ross [1/cm]
1.5
1.0
0.5
0.0
z / r
1E-4
0.001
0.01
0.1
1
1E-4
0.001
0.01
1
10
100
r [AU]


-0.5
0.0
0.5
1.0
log cT [km/s]
10
3
1
0.6
0.3
z / r
0.0
0.5
1.0
1.5
1
10
100
r [AU]



heating by formation of H2 on dust
cosmic ray heating
PAH heating
X-ray Coulomb heating
X-ray H2 dissociation heating
chemical heating



CII line cooling

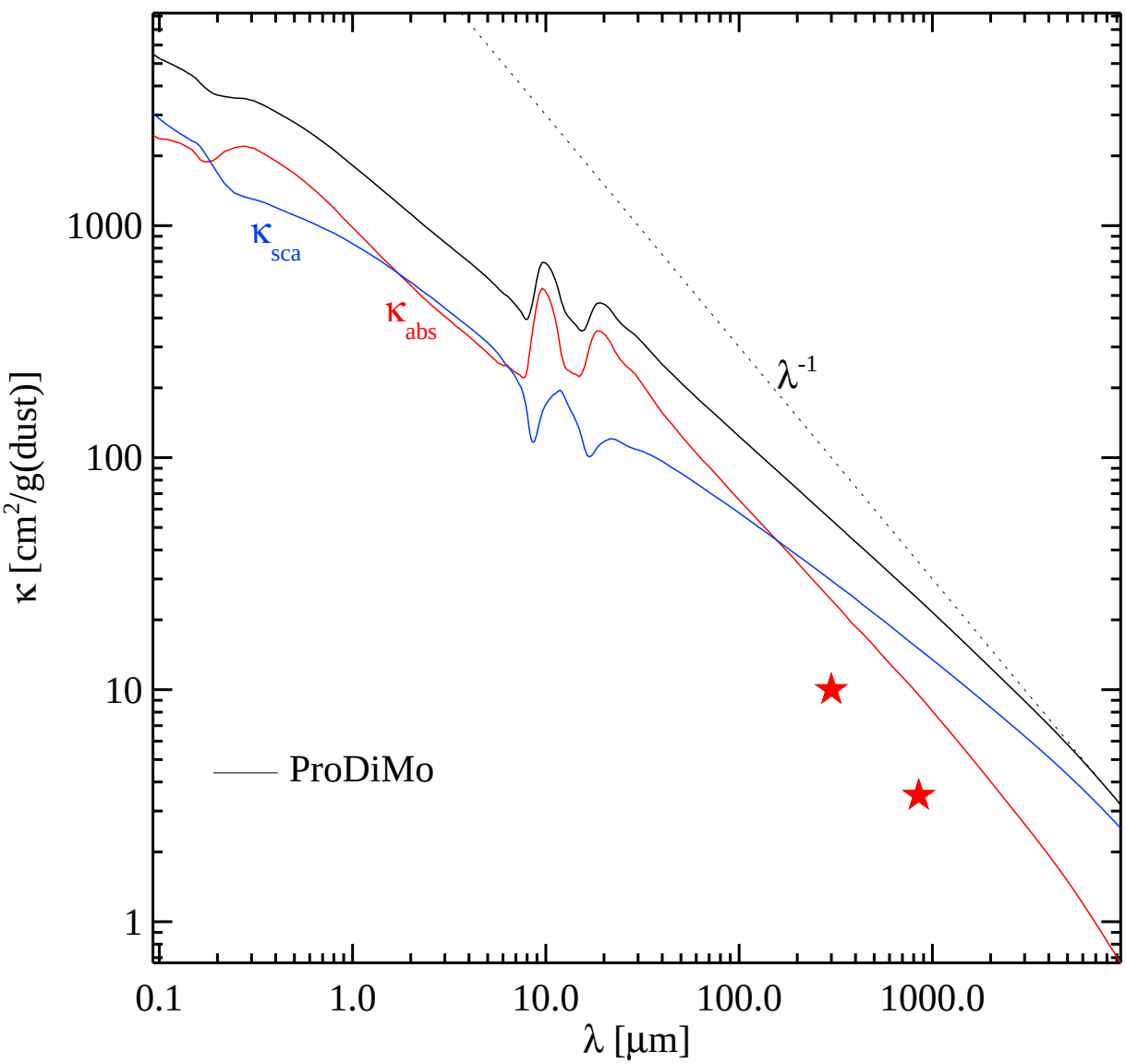
cooling by thermal accomodation on grains

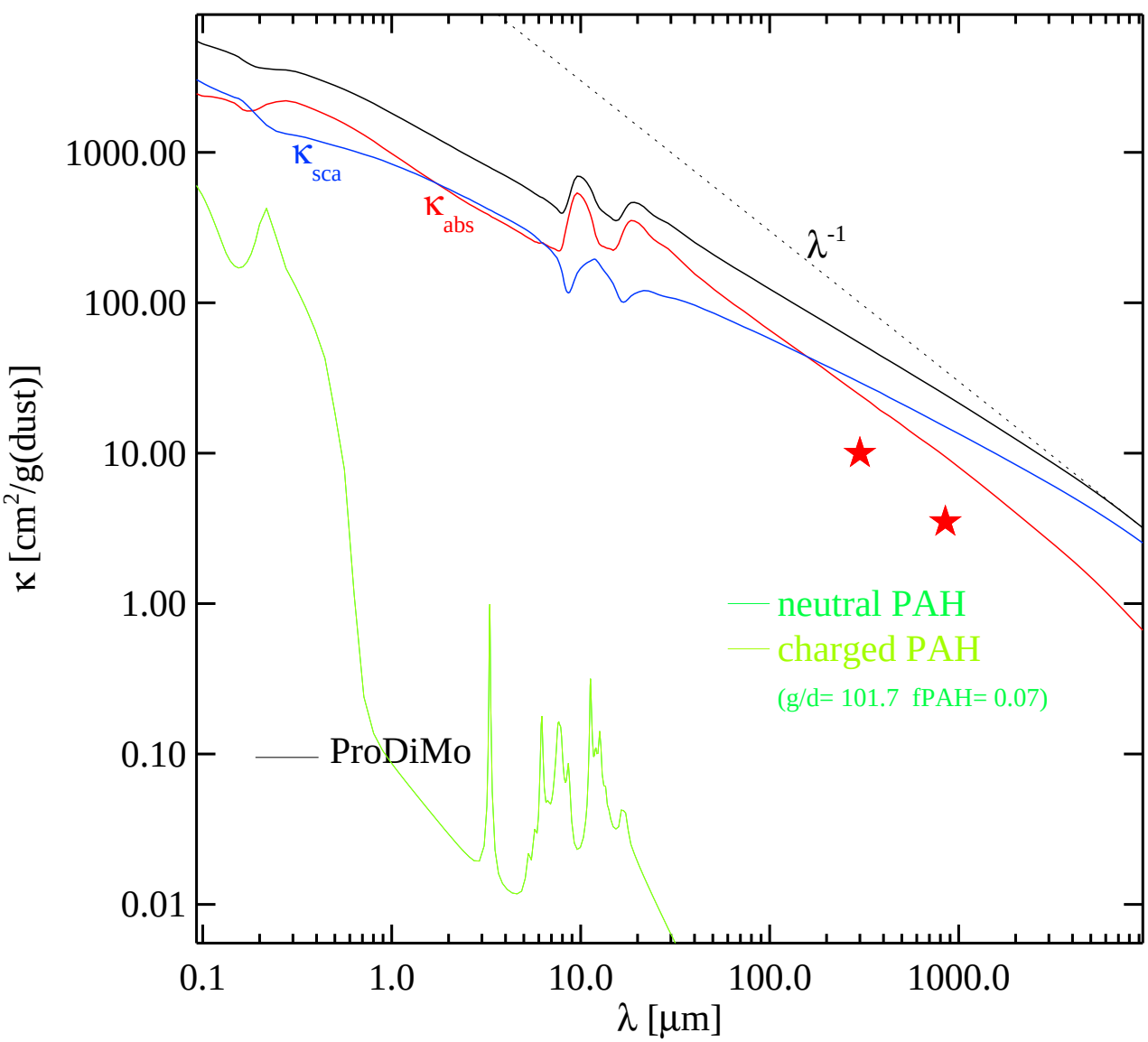
Ly-alpha line cooling

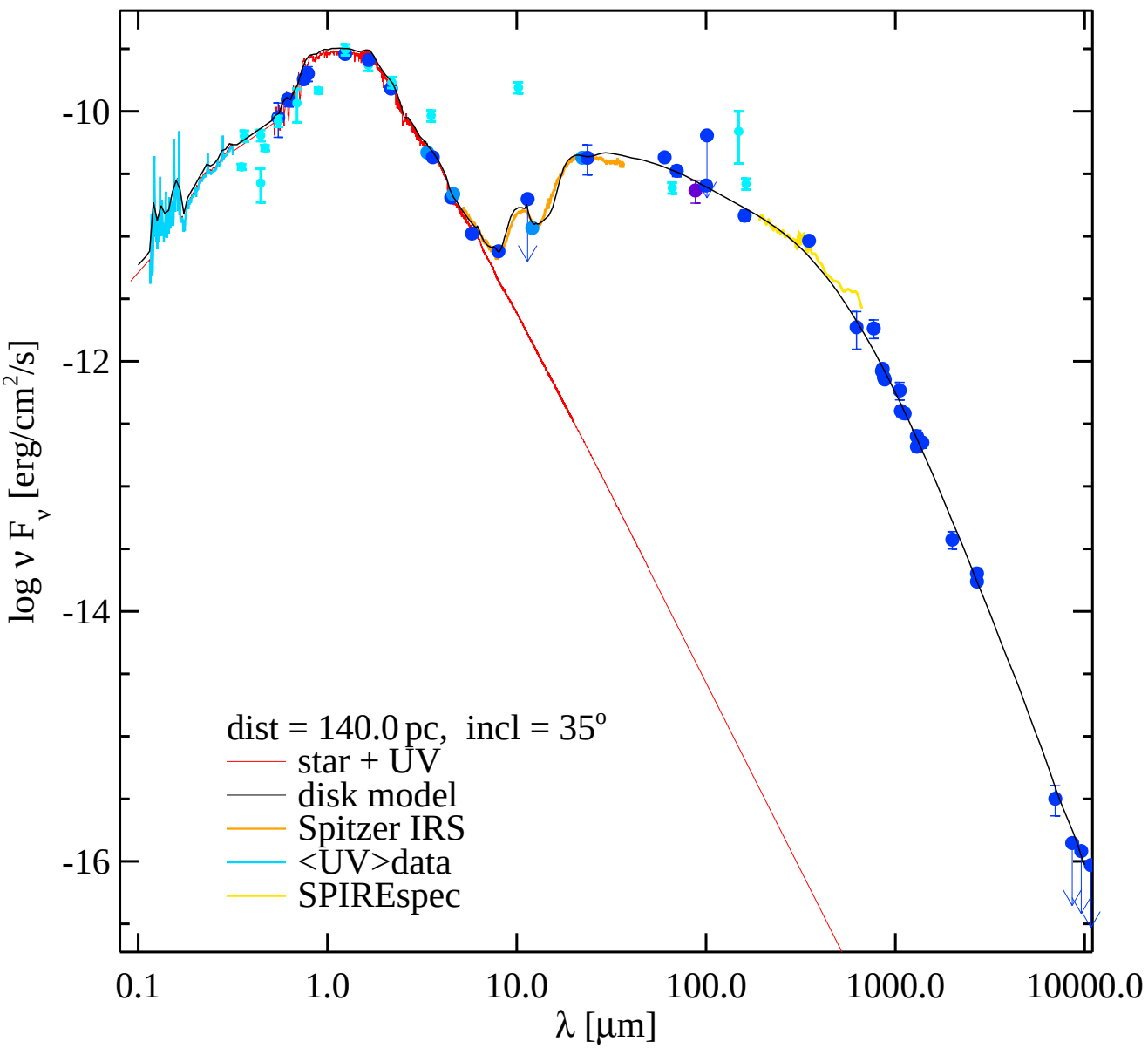
OI line cooling

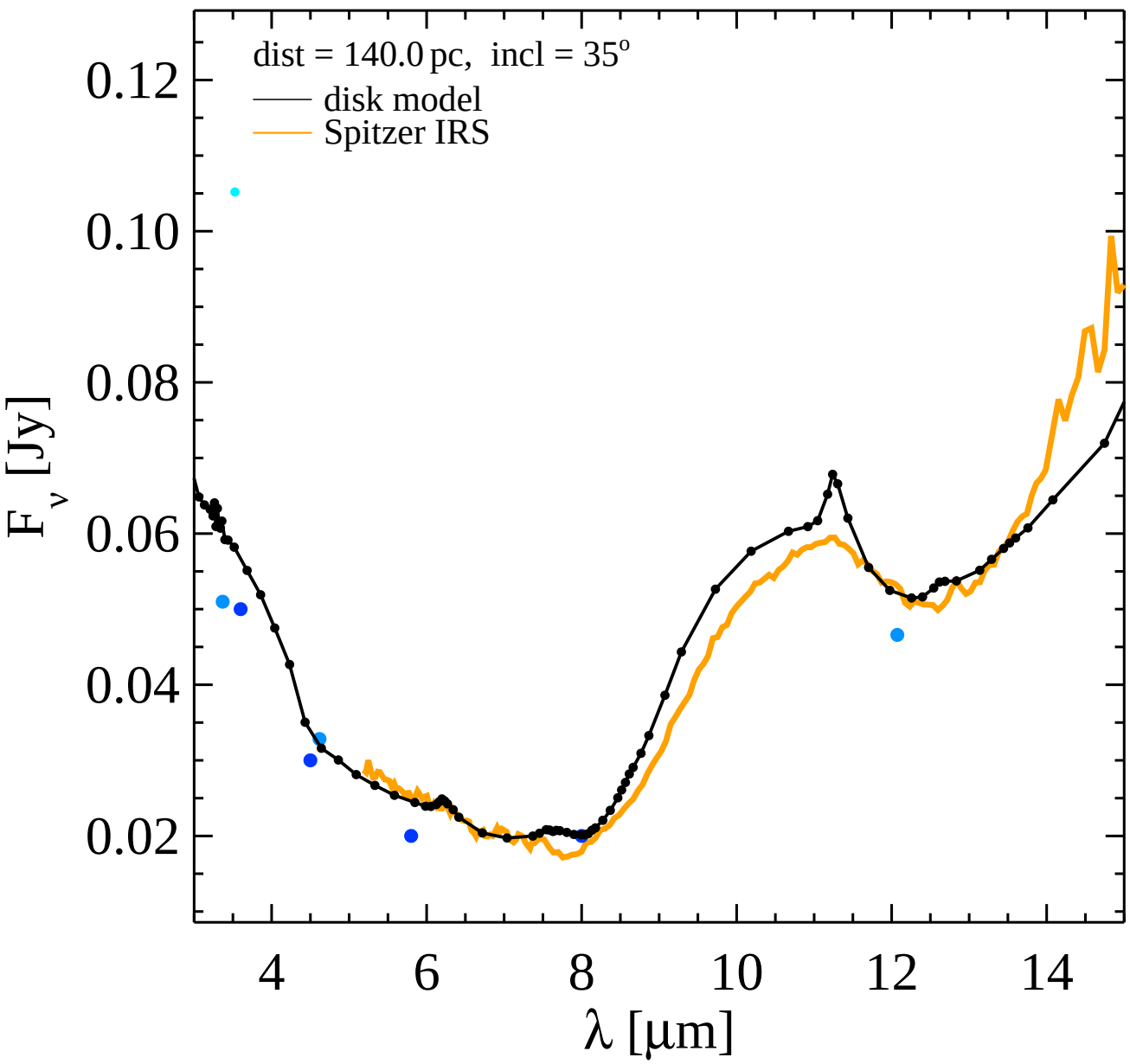
H2O rot and rovib cooling

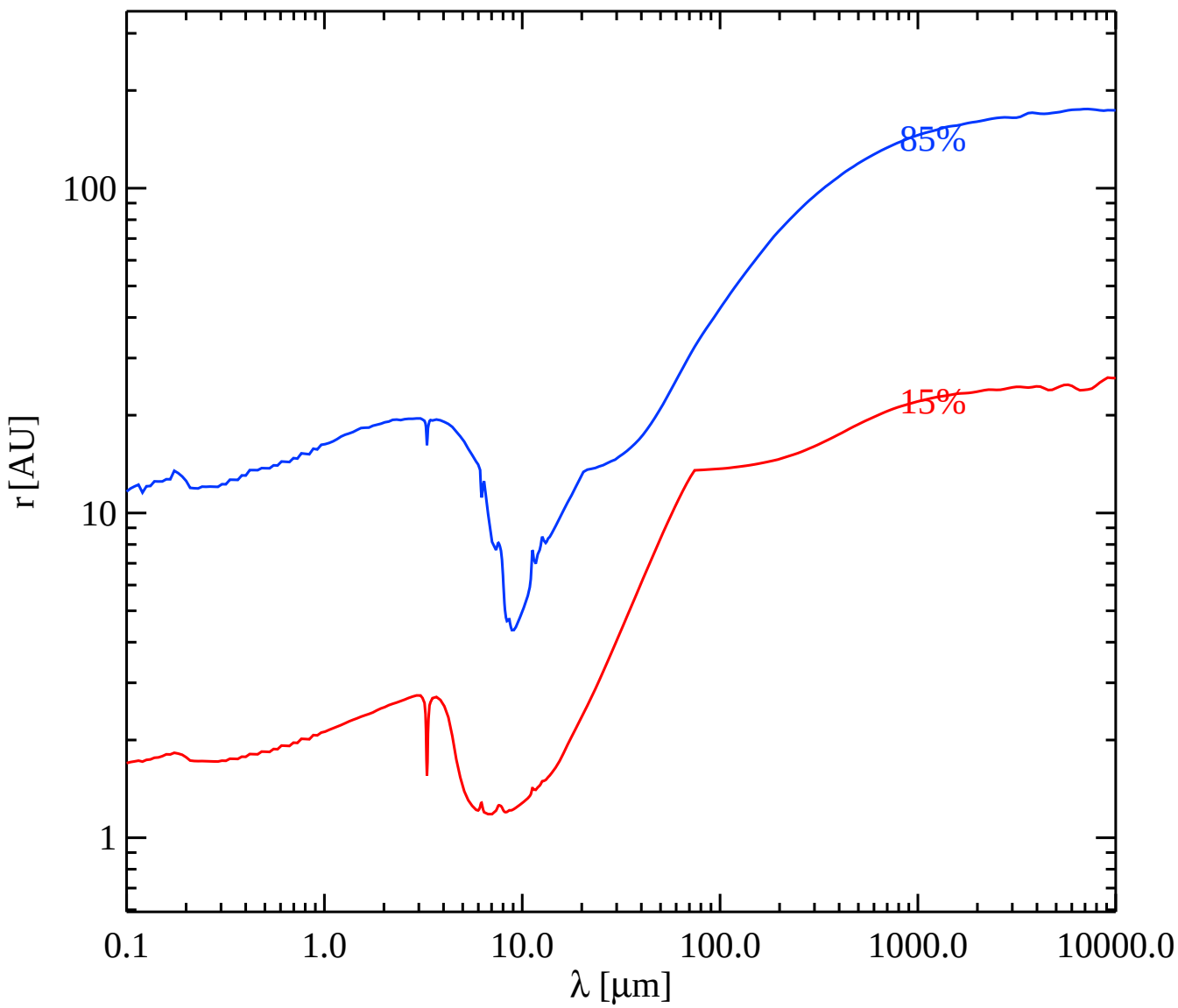
Hmin recombination cooling

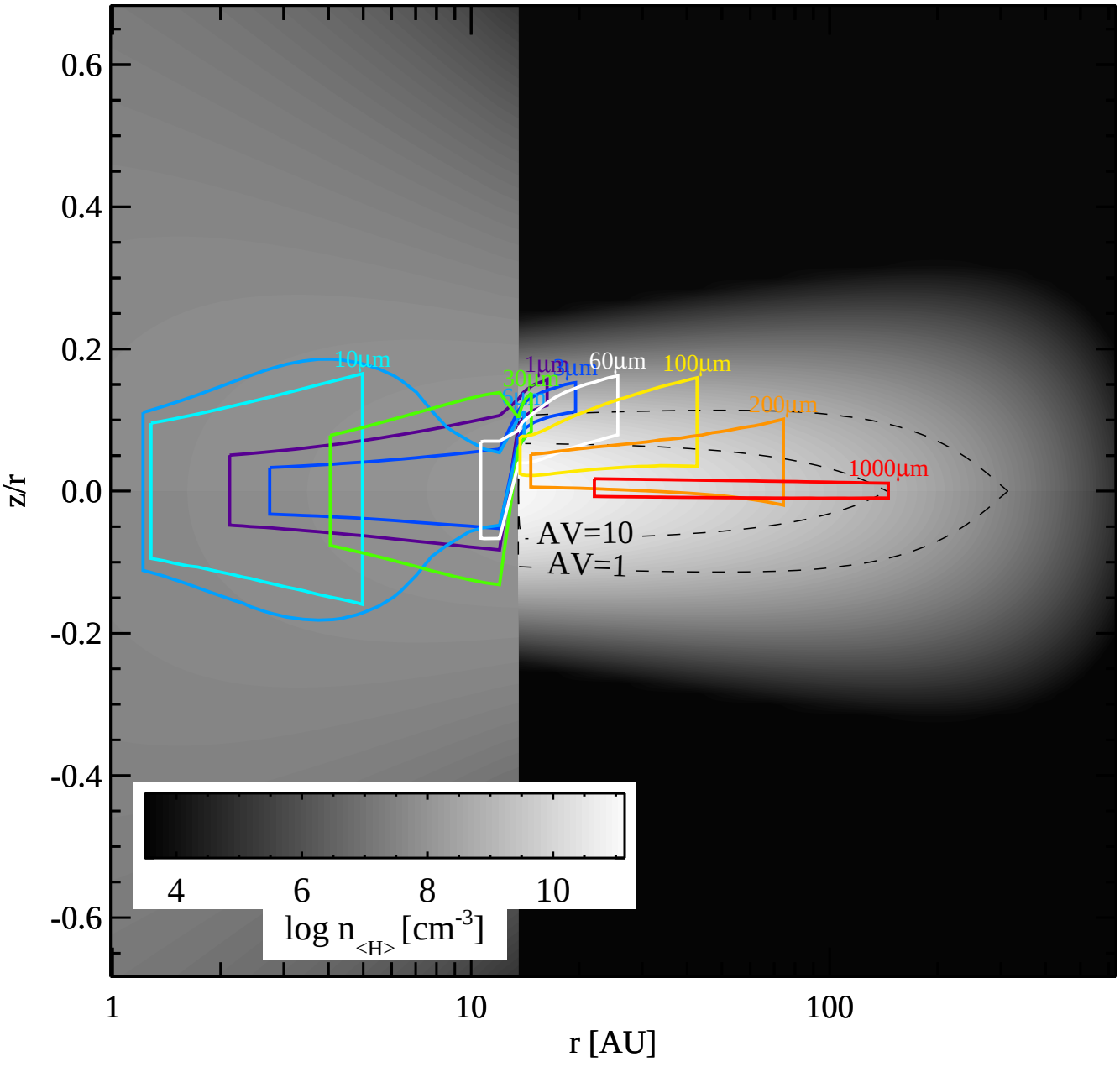

1000
100
10
1
κ [cm²/g(dust)]
κsca
κabs
λ-1
ProDiMo
0.1
1.0
10.0
100.0
1000.0
λ [μm]

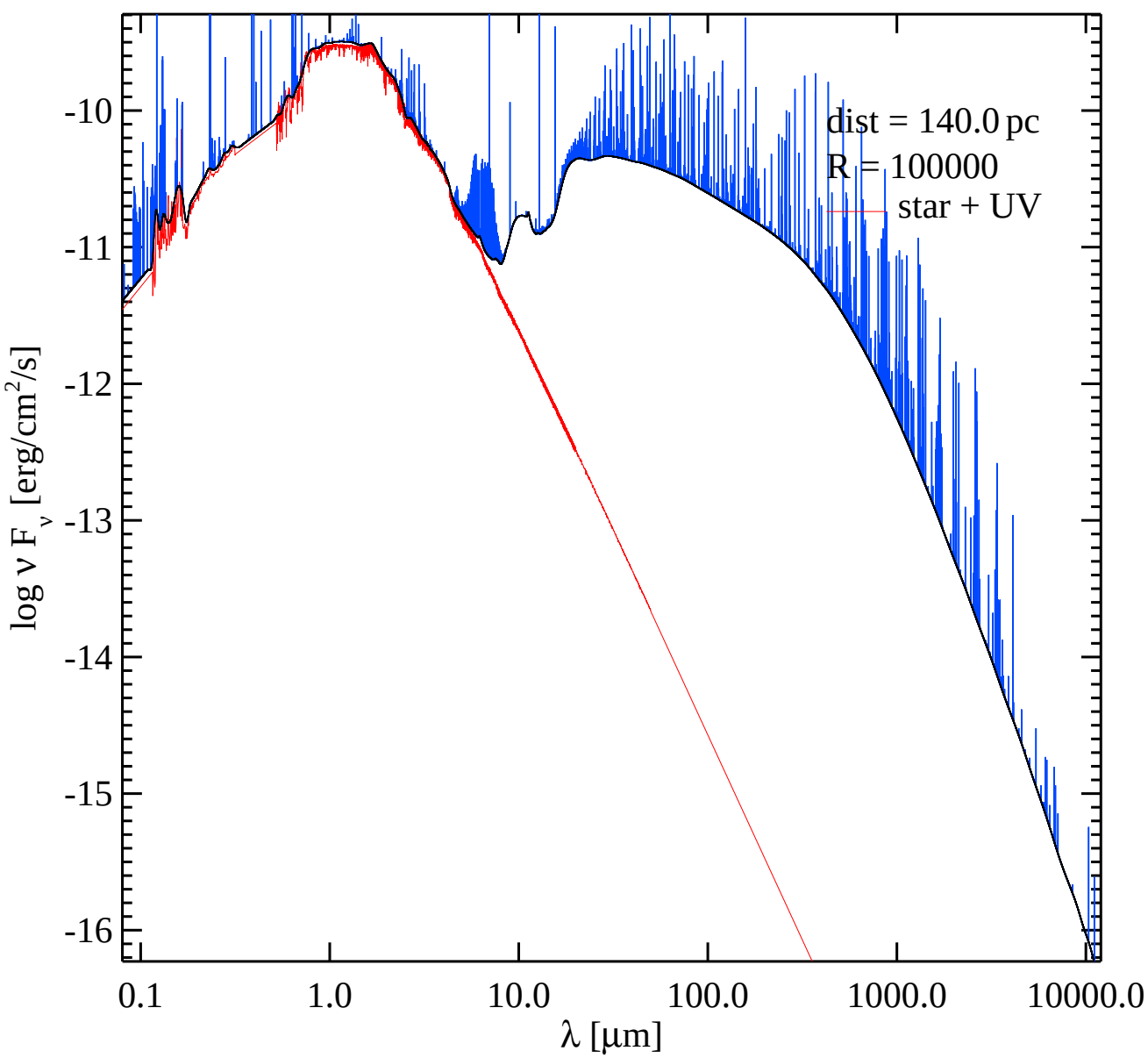

1000.00
100.00
10.00
1.00
0.10
0.01
κ [cm²/g(dust)]
0.1
1.0
10.0
100.0
1000.0
λ [μm]
κsca
κabs
λ-1
neutral PAH
charged PAH
(g/d= 101.7 fPAH= 0.07)
ProDiMo

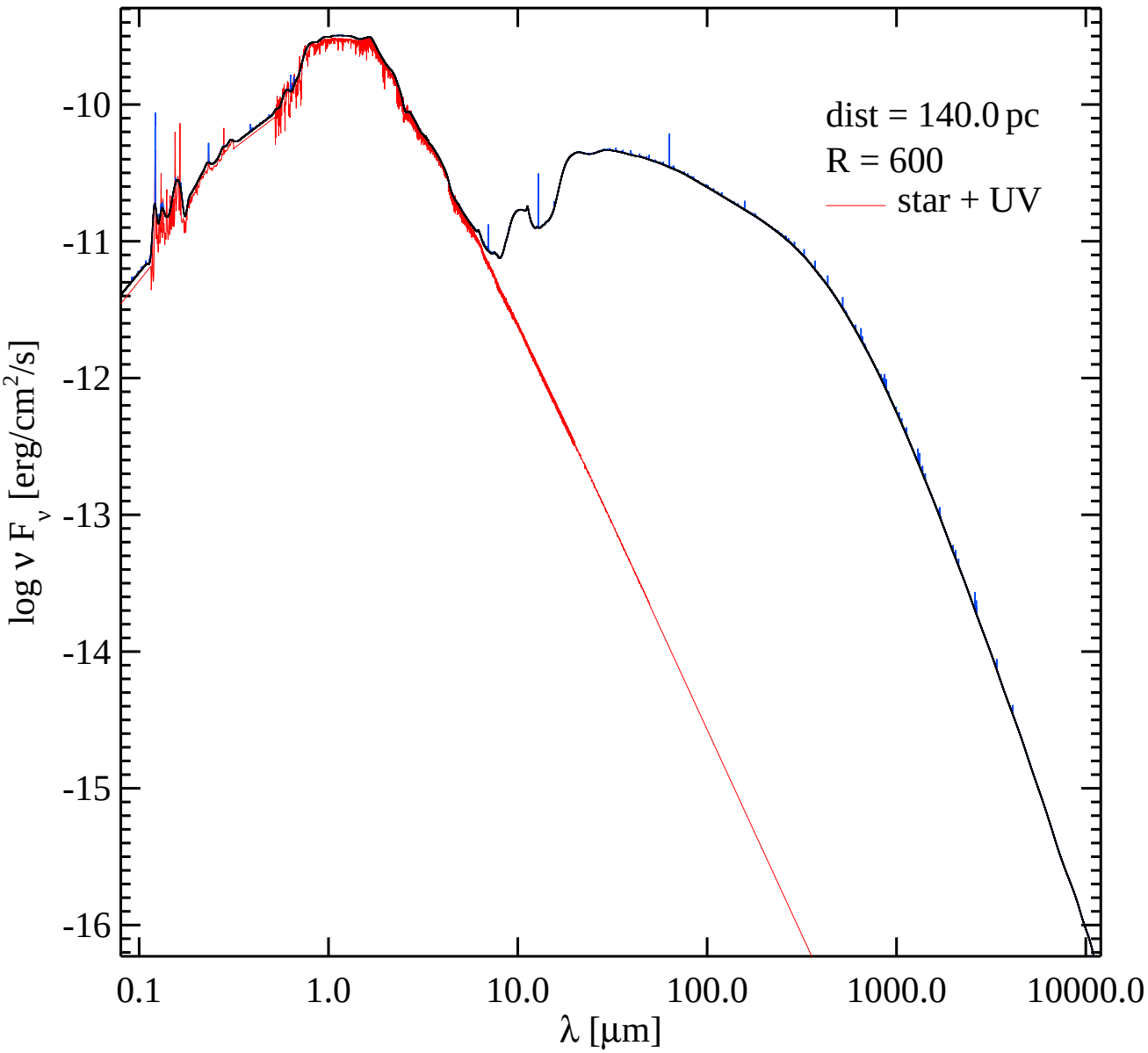

-10
-12
-14
-16
log ν F_ν [erg/cm²/s]
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]
dist = 140.0 pc, incl = 35°
star + UV
disk model
Spitzer IRS
<UV>data
SPIREspec

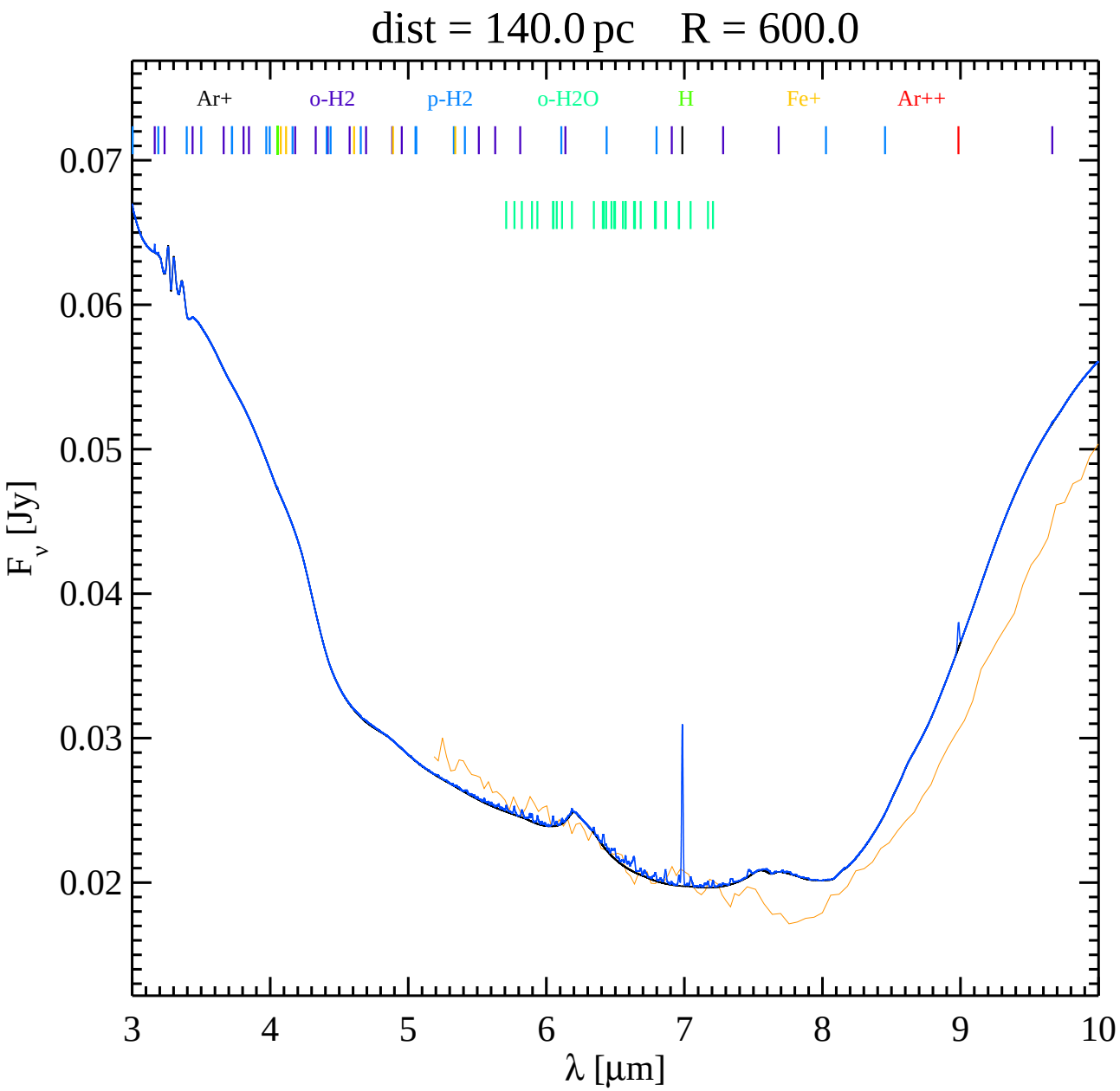

dist = 140.0 pc, incl = 35°
disk model
Spitzer IRS
0.12
0.10
0.08
0.06
0.04
0.02
F_ν [Jy]
4
6
8
10
12
14
λ [μm]

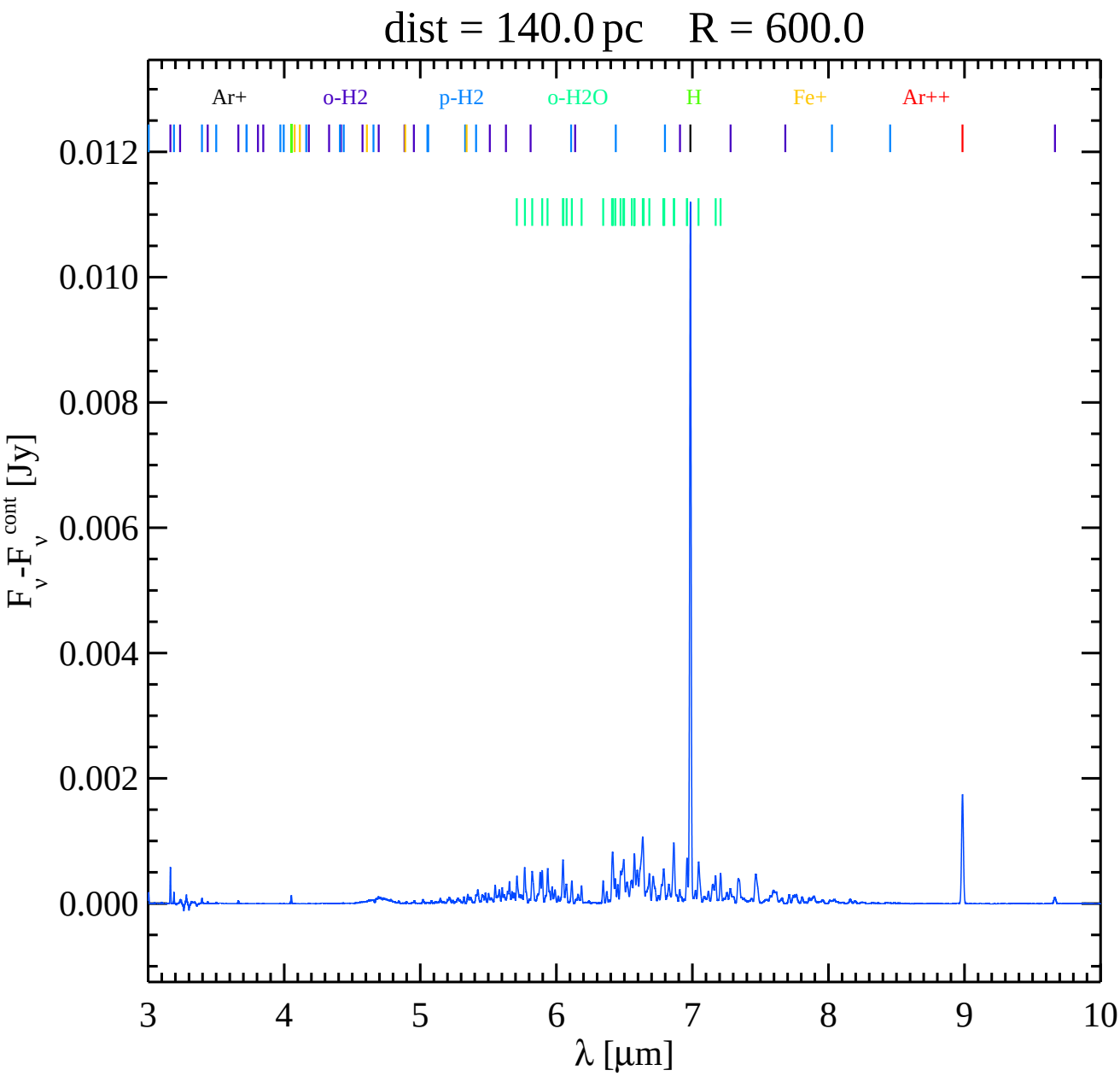

85%
15%
100
10
1
r [AU]
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

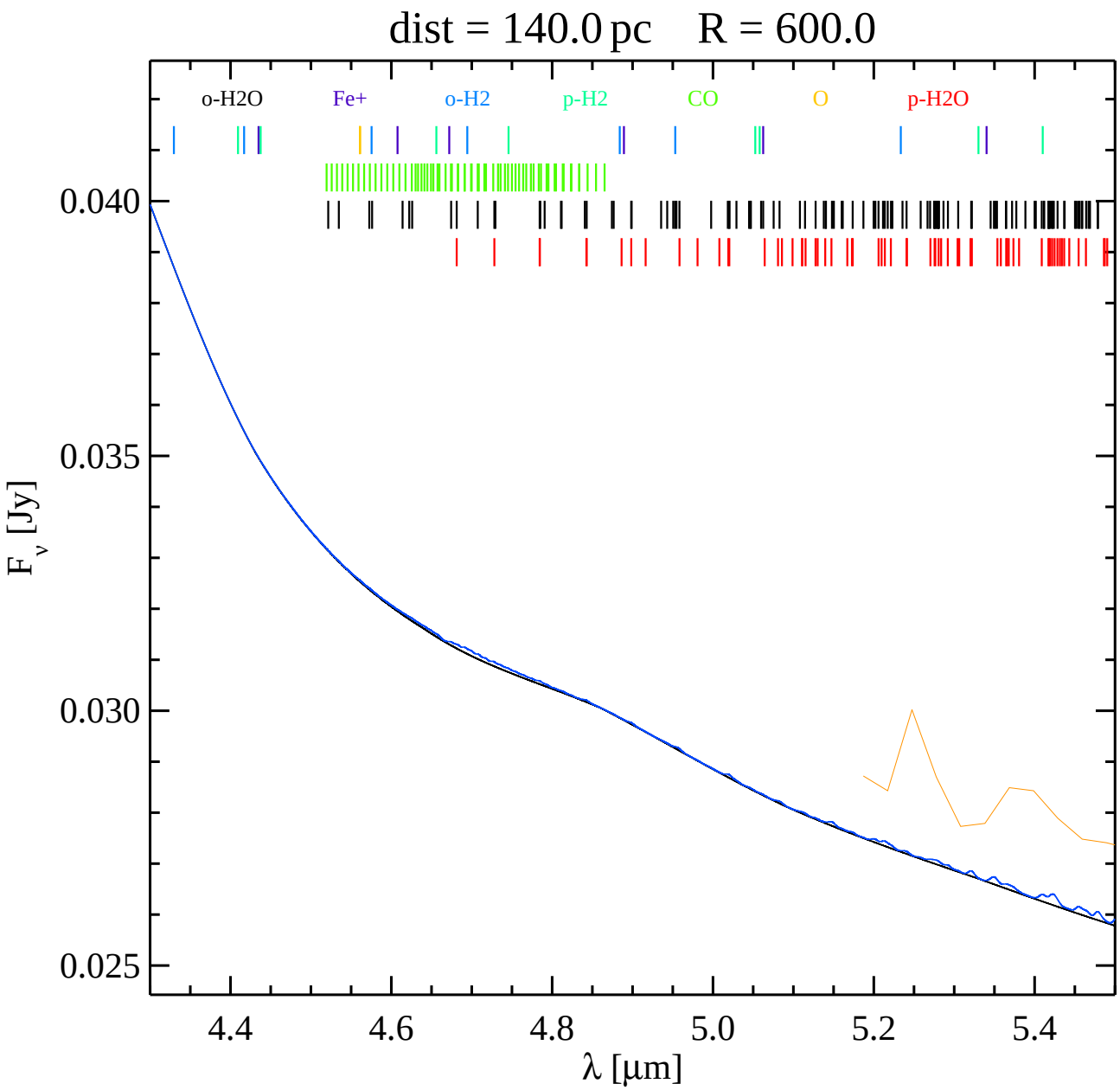

0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
z/r
1
10
100
r [AU]
10μm
1μm
3μm
30μm
60μm
100μm
200μm
1000μm
AV=10
AV=1
4
6
8
10
log n<H> [cm-3]

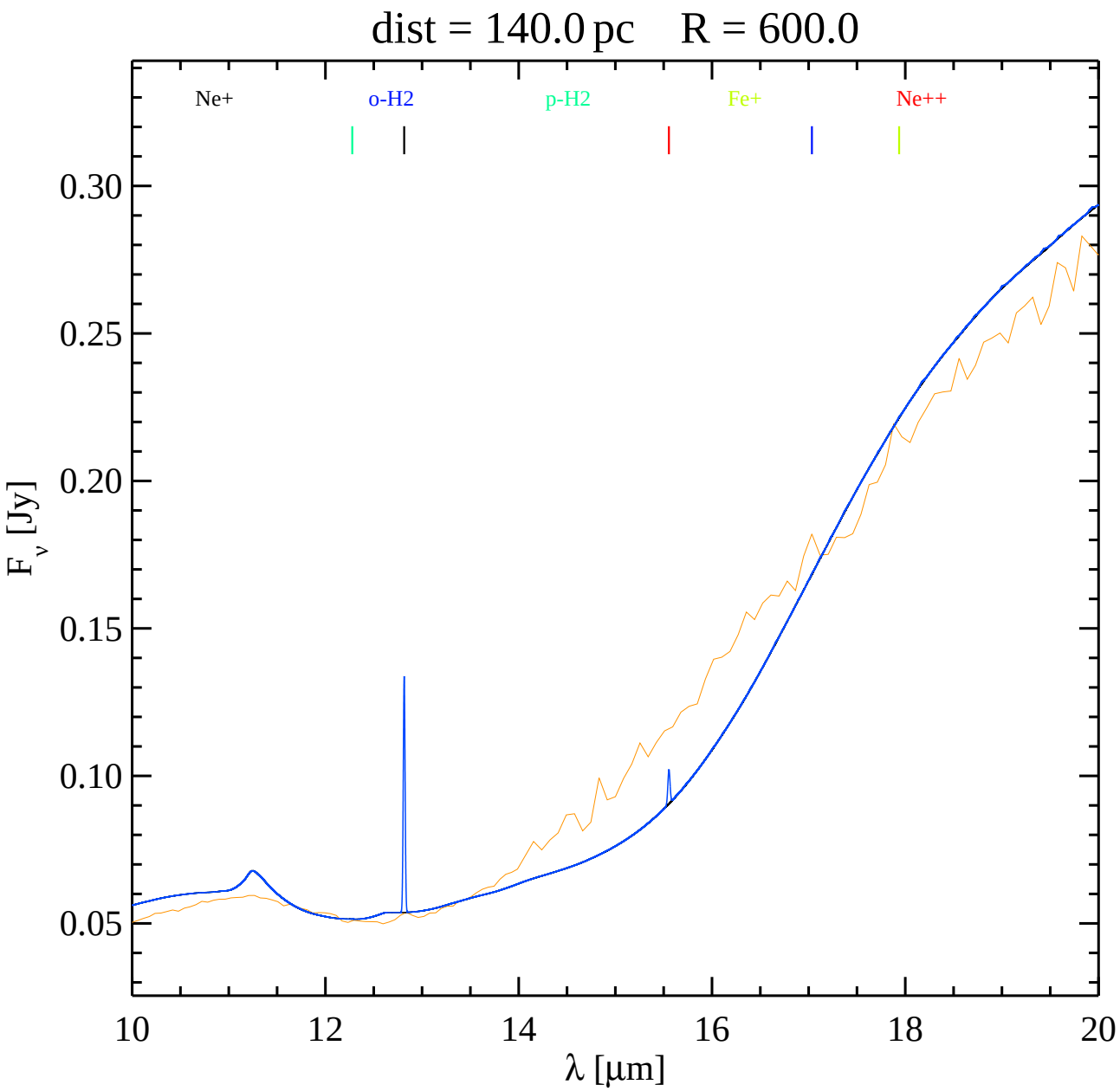

dist = 140.0 pc
R = 100000
star + UV
log ν F_ν [erg/cm²/s]
-10
-11
-12
-13
-14
-15
-16
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

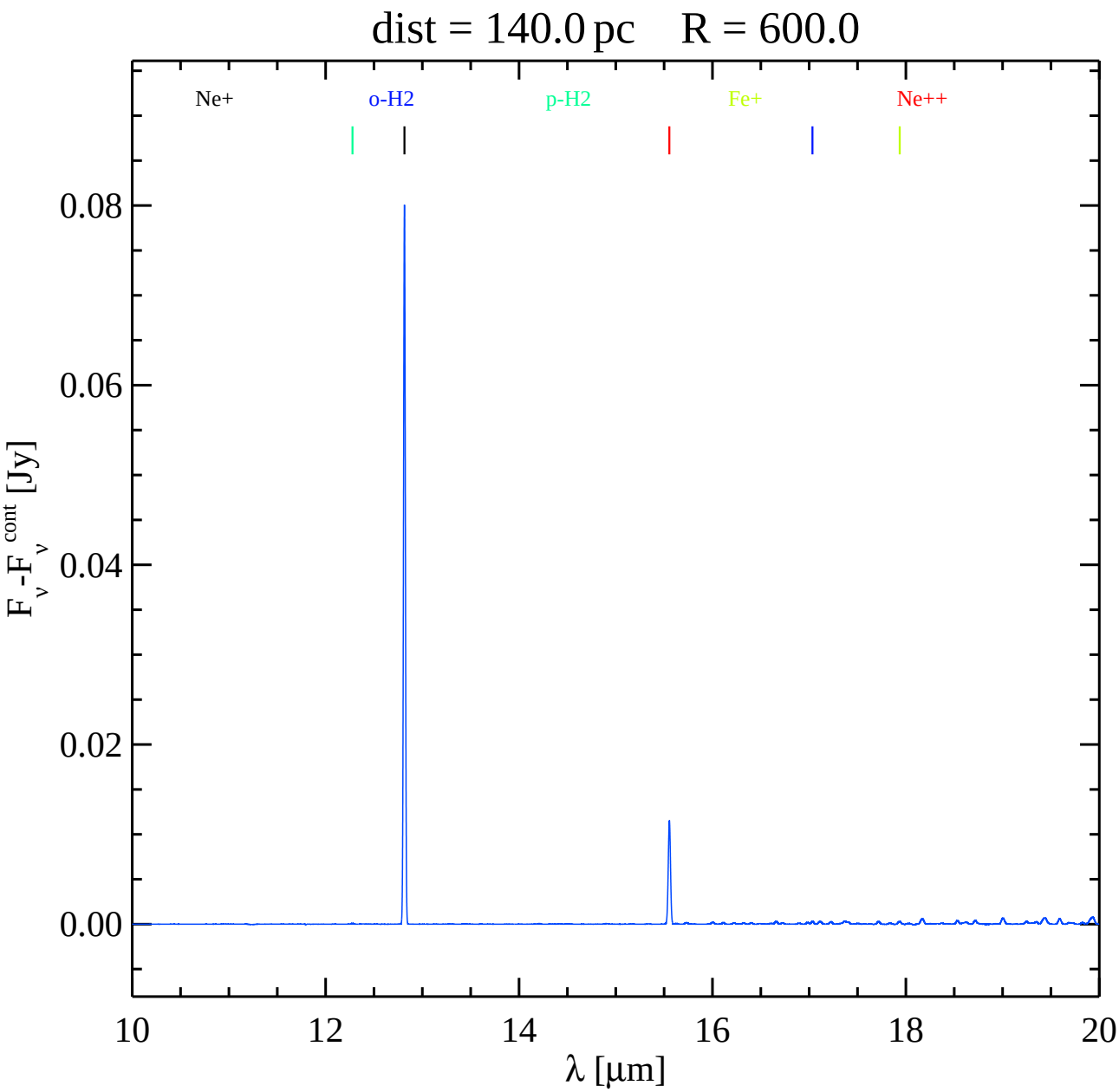

dist = 140.0 pc
R = 600
star + UV
log ν F_ν [erg/cm²/s]
-10
-11
-12
-13
-14
-15
-16
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

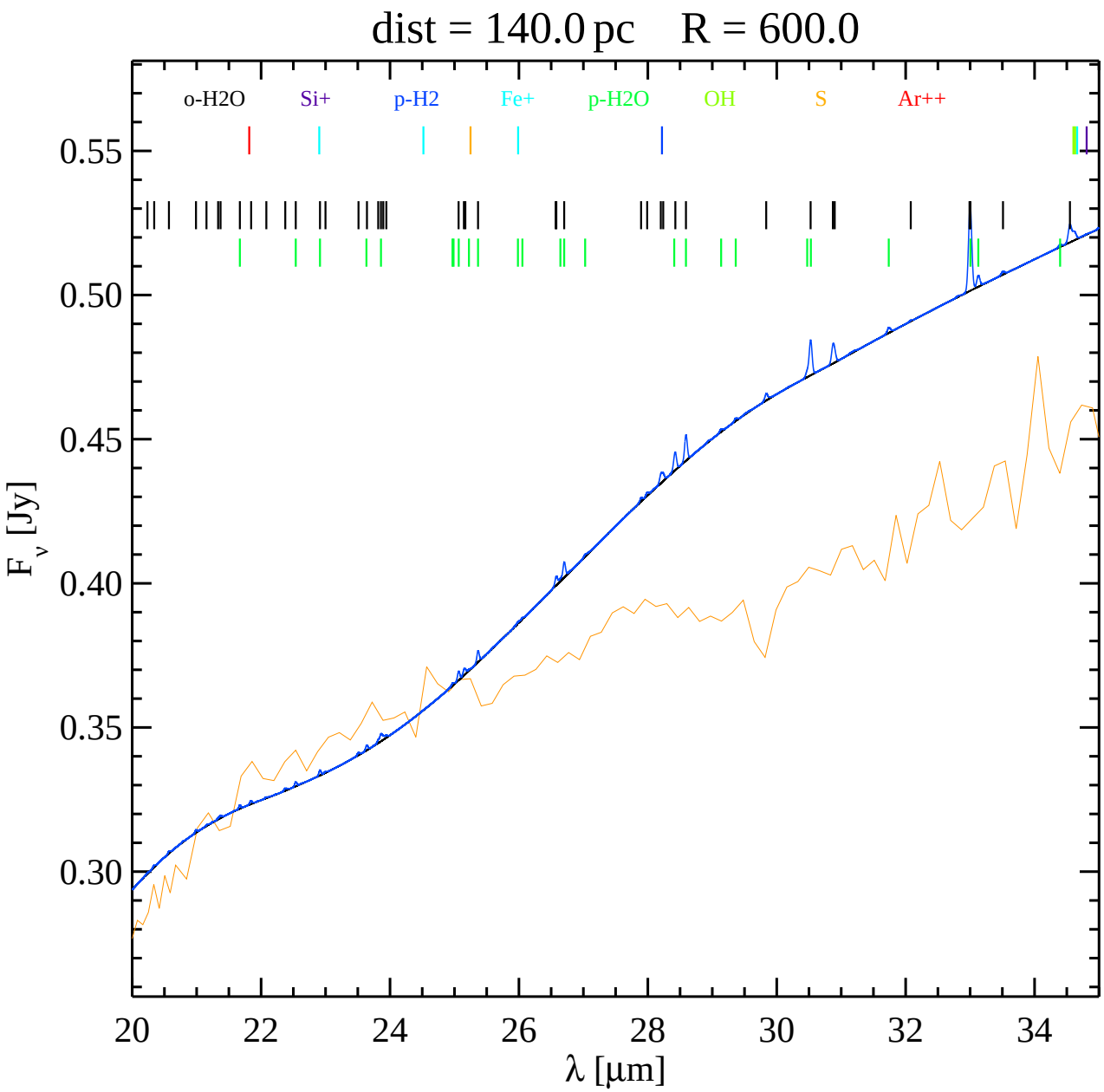

dist = 140.0 pc R = 600.0
Ar+
o-H2
p-H2
o-H2O
H
Fe+
Ar++
0.07
0.06
0.05
0.04
0.03
0.02
F_ν [Jy]
3
4
5
6
7
8
9
10
λ [μm]

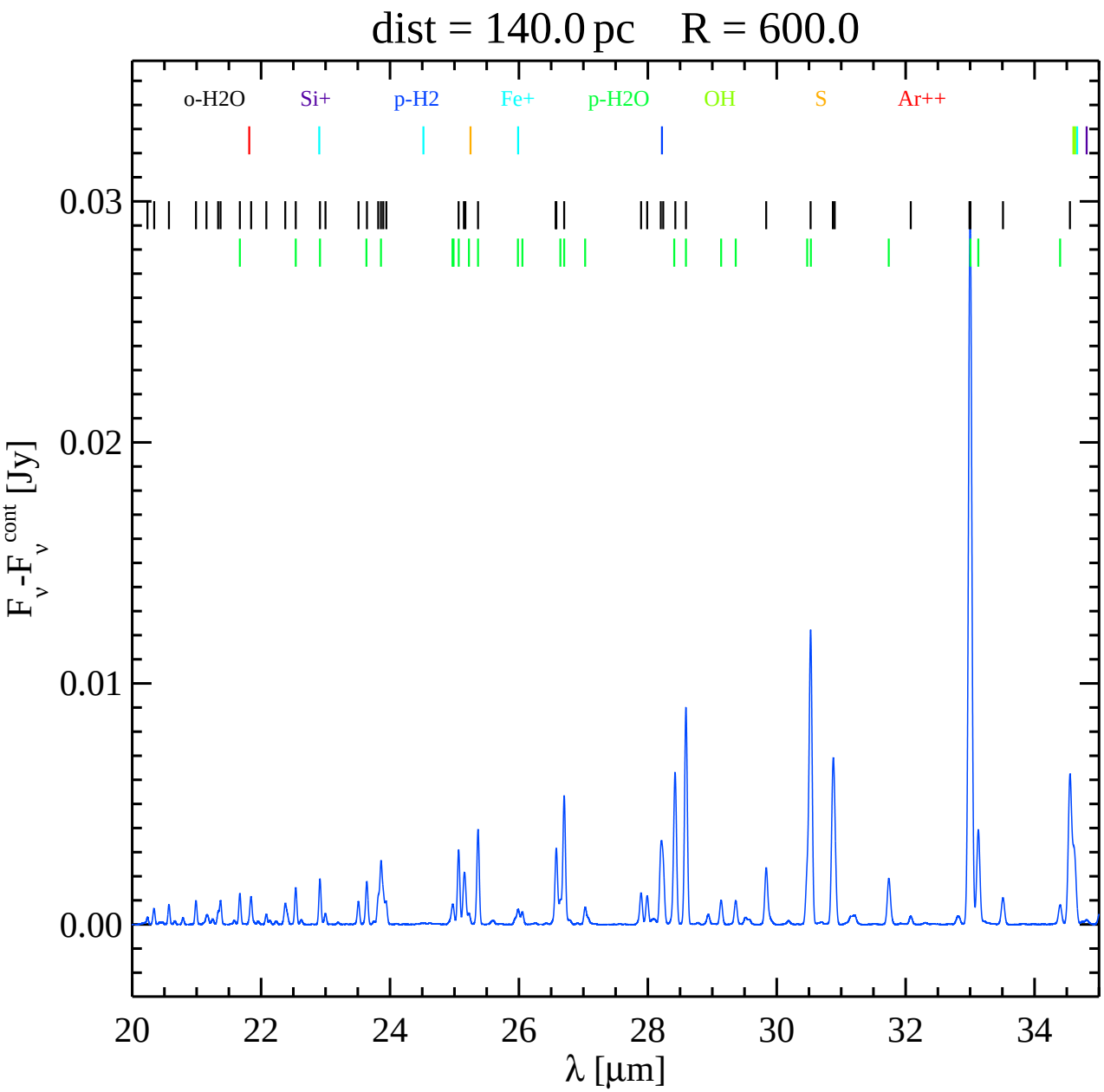

dist = 140.0 pc R = 600.0
Ar+
o-H2
p-H2
o-H2O
H
Fe+
Ar++
0.012
0.010
0.008
0.006
0.004
0.002
0.000
F_ν - F_ν^cont [Jy]
3
4
5
6
7
8
9
10
λ [μm]

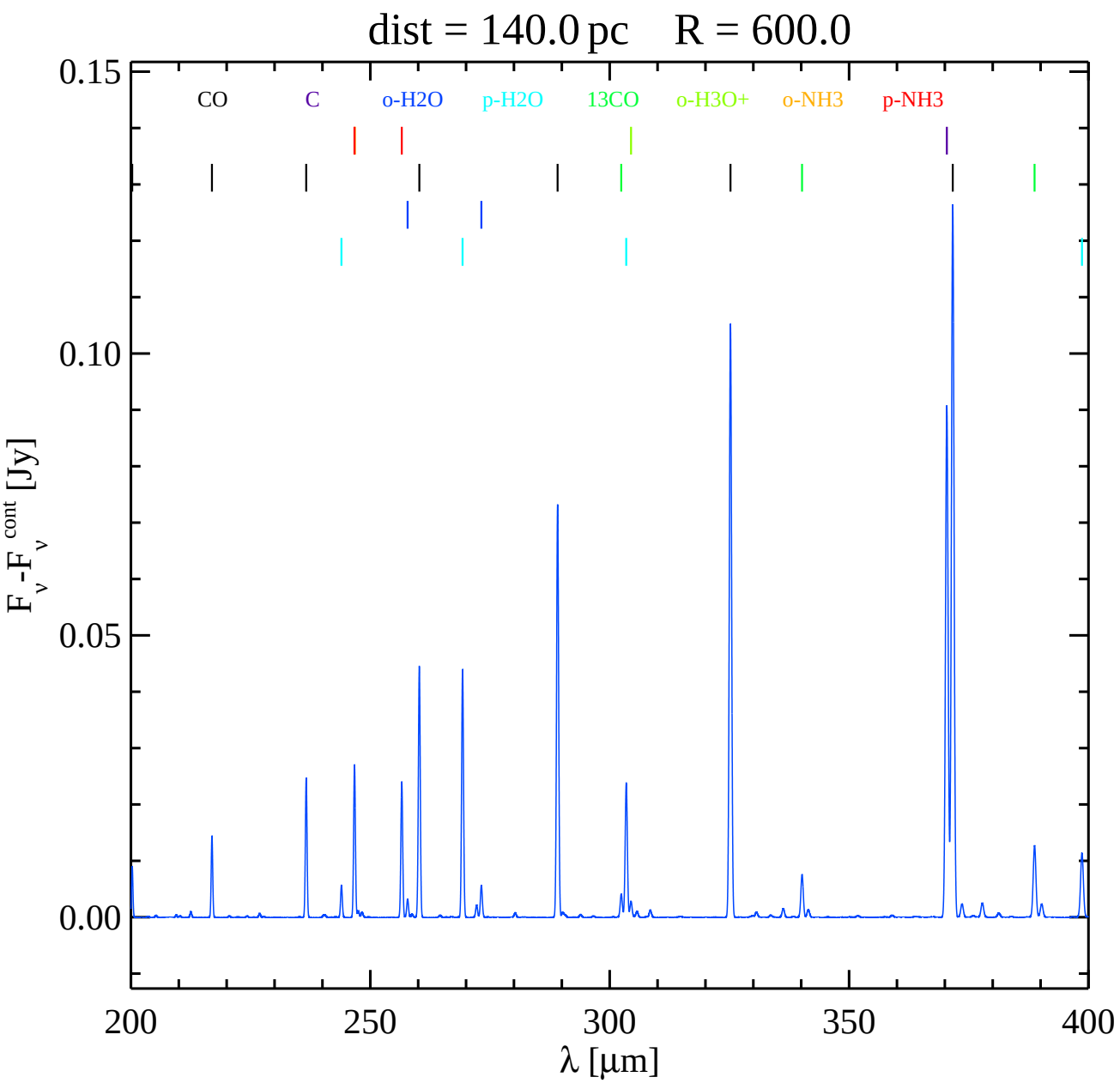

dist = 140.0 pc R = 600.0
o-H2O
Fe+
o-H2
p-H2
CO
O
p-H2O
0.040
0.035
0.030
0.025
F_ν [Jy]
4.4
4.6
4.8
5.0
5.2
5.4
λ [μm]

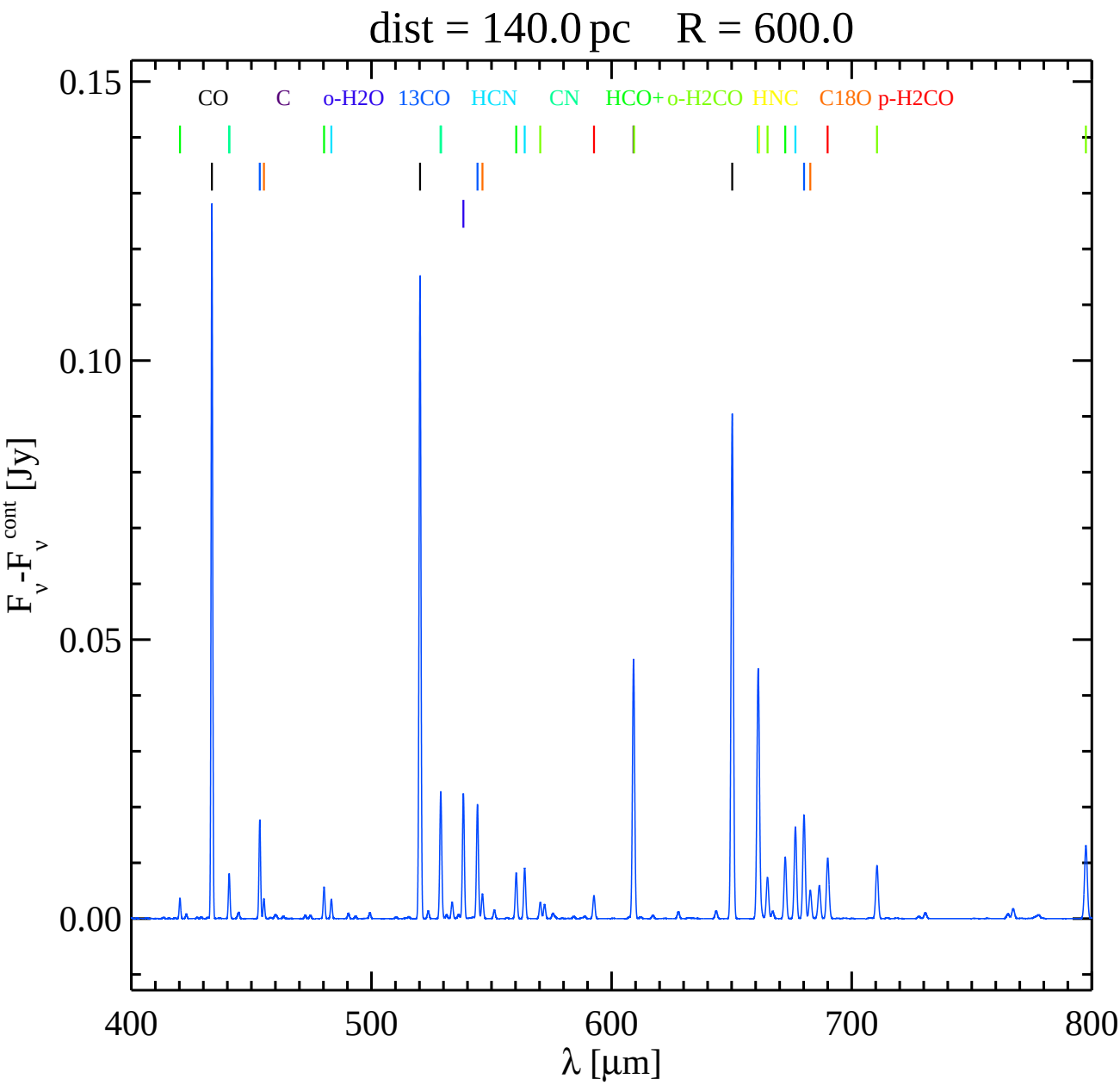

dist = 140.0 pc R = 600.0
Ne+
o-H2
p-H2
Fe+
Ne++
0.30
0.25
0.20
0.15
0.10
0.05
F_ν [Jy]
10
12
14
16
18
20
λ [μm]

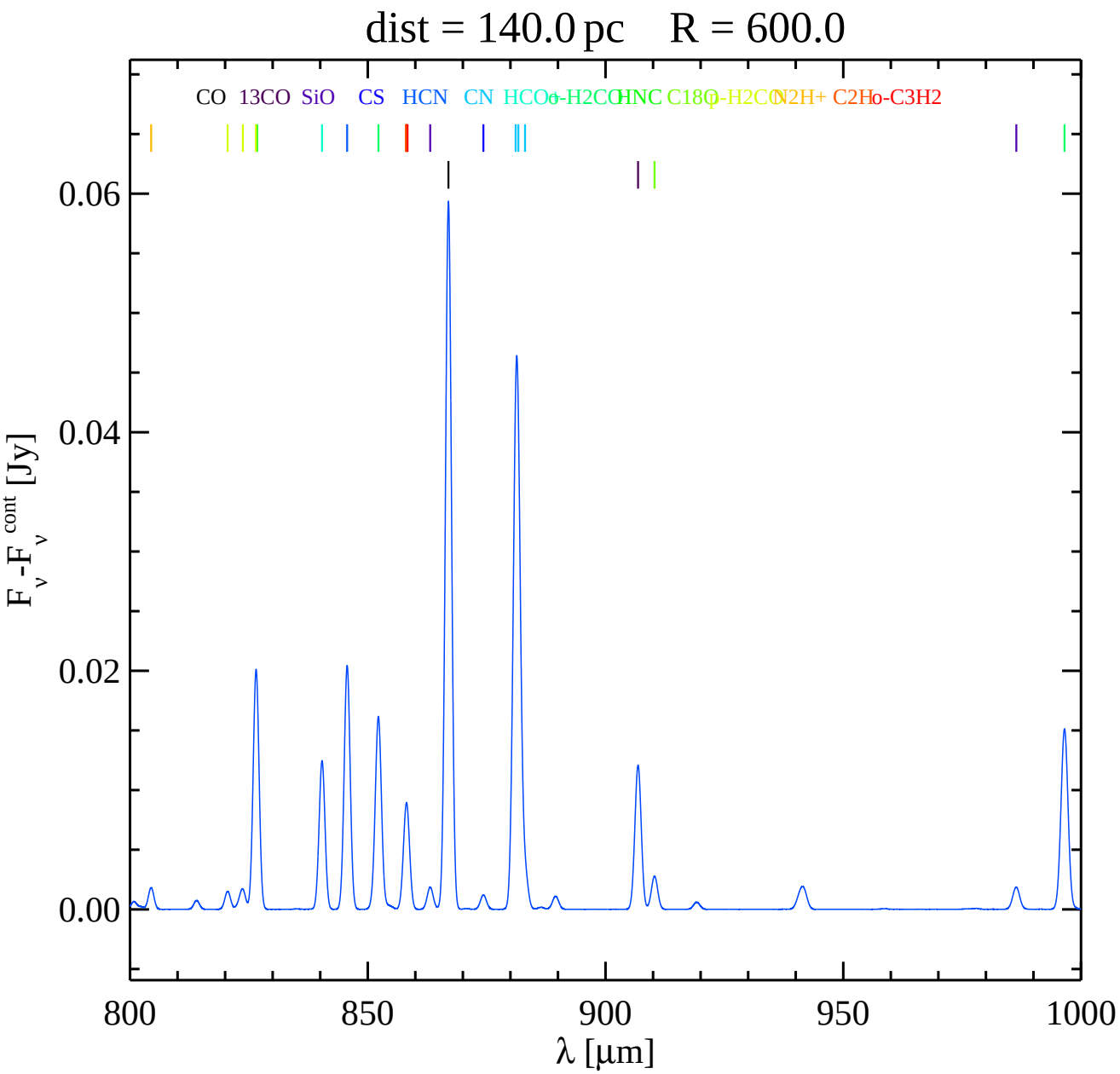

dist = 140.0 pc R = 600.0
Ne+
o-H2
p-H2
Fe+
Ne++
0.08
0.06
0.04
0.02
0.00
F_ν -F_ν^cont [Jy]
10
12
14
16
18
20
λ [μm]

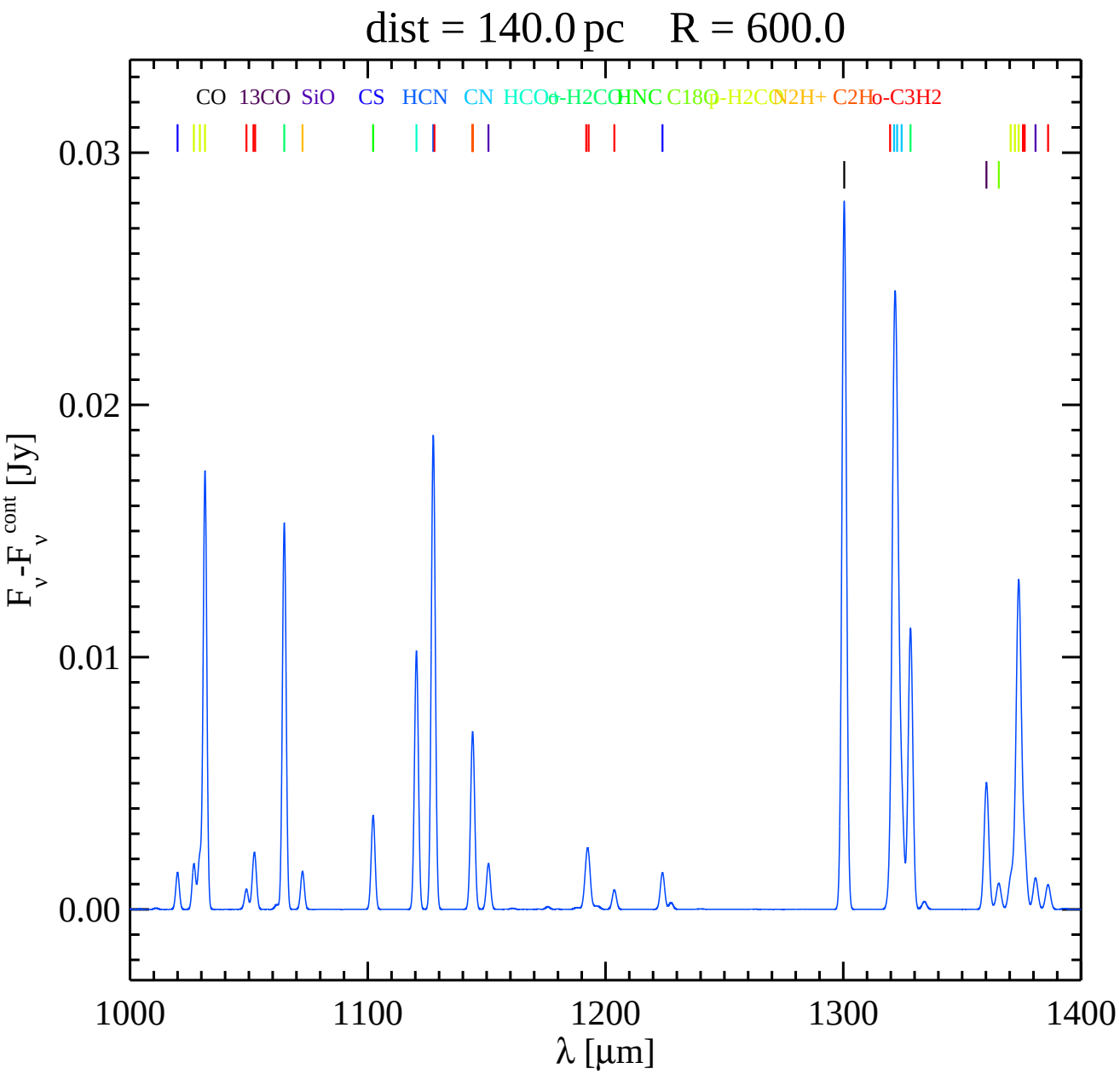

dist = 140.0 pc R = 600.0
o-H2O
Si+
p-H2
Fe+
p-H2O
OH
S
Ar++
0.55
0.50
0.45
0.40
0.35
0.30
F_ν [Jy]
20
22
24
26
28
30
32
34
λ [μm]

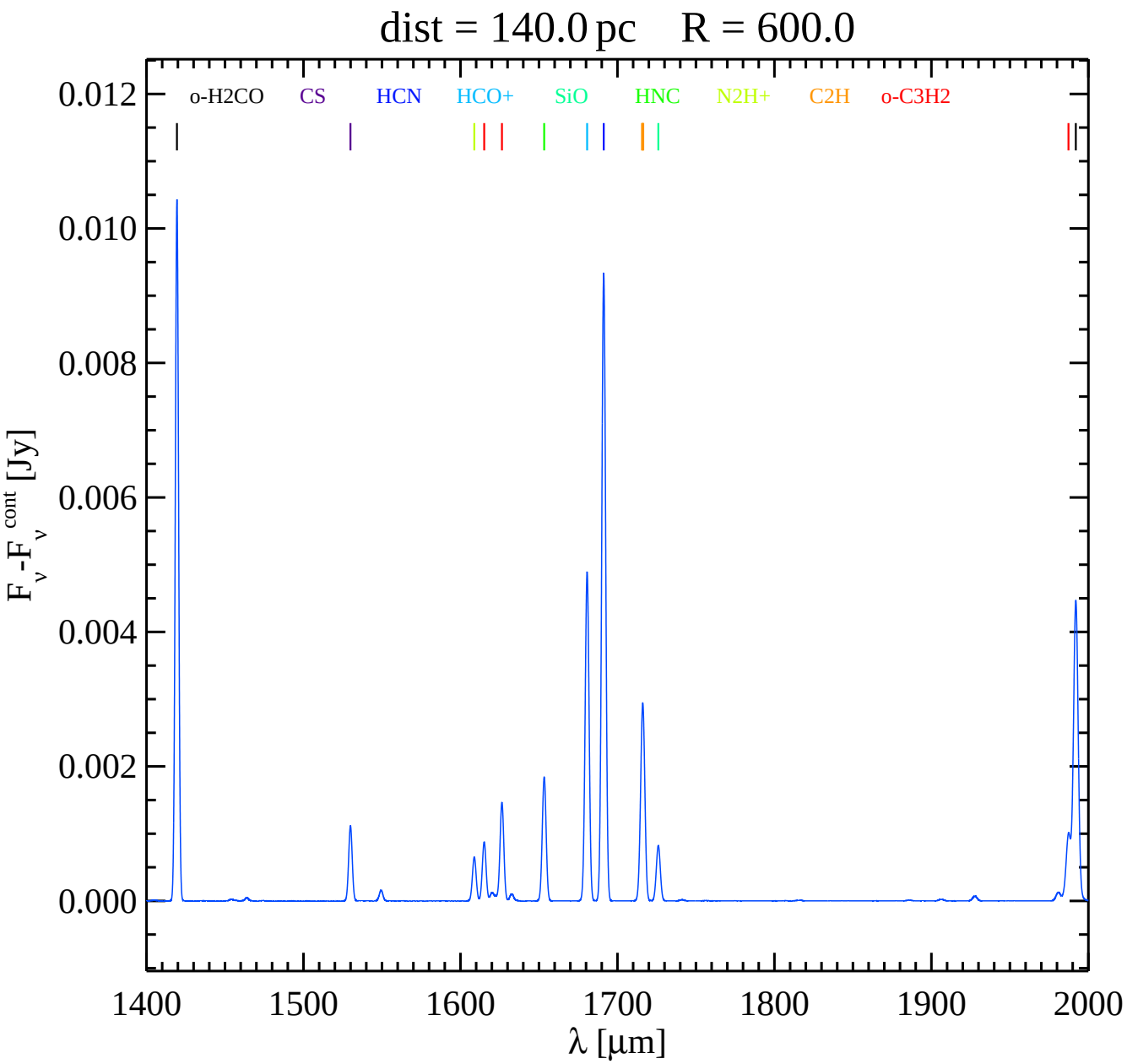

dist = 140.0 pc R = 600.0
o-H2O
Si+
p-H2
Fe+
p-H2O
OH
S
Ar++
0.03
0.02
0.01
0.00
F_ν -F_ν^cont [Jy]
20
22
24
26
28
30
32
34
λ [μm]

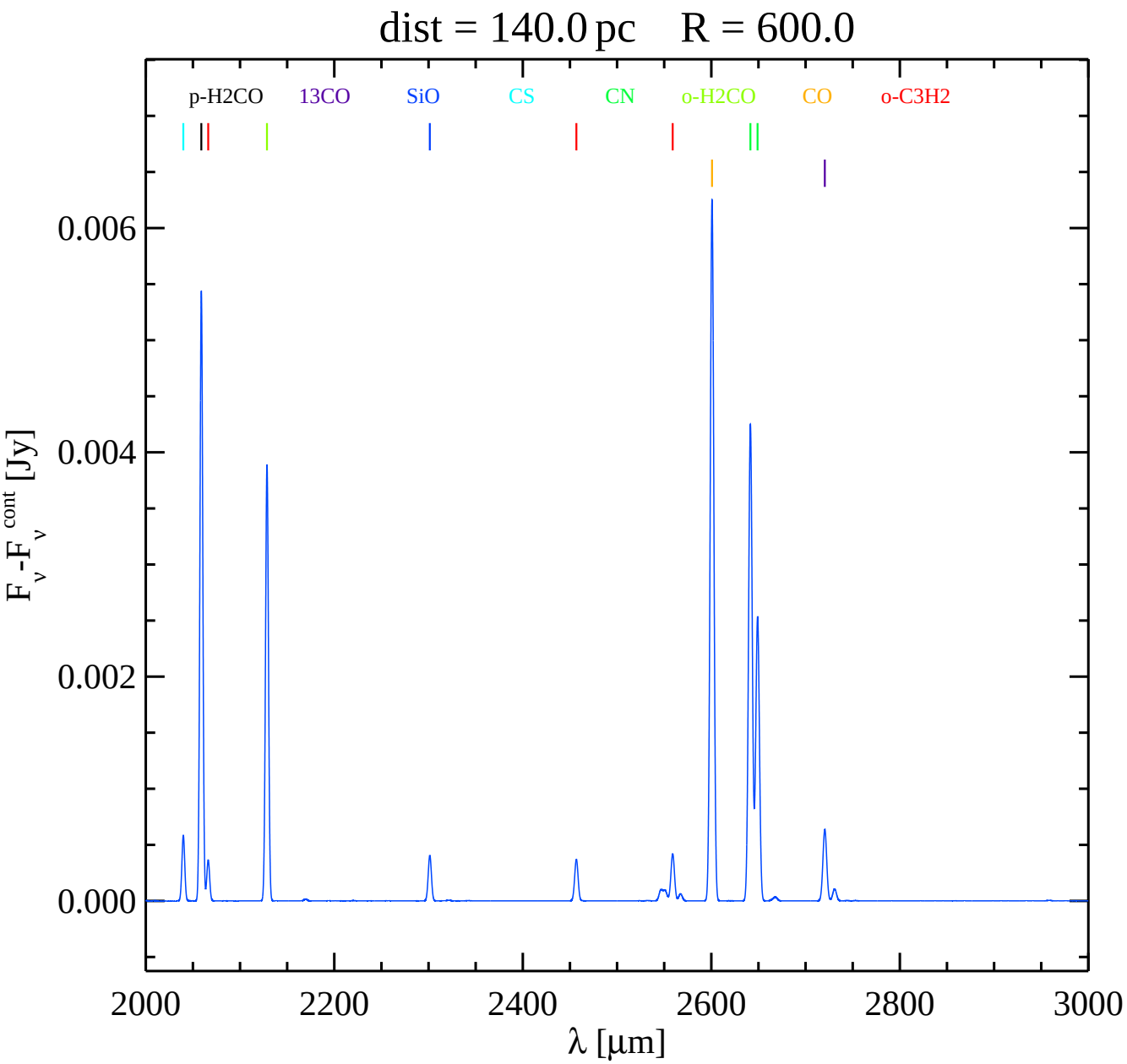

dist = 140.0 pc R = 600.0
CO
C
o-H2O
p-H2O
13CO
o-H3O+
o-NH3
p-NH3
0.15
0.10
0.05
0.00
F_ν -F_ν^cont [Jy]
200
250
300
350
400
λ [μm]

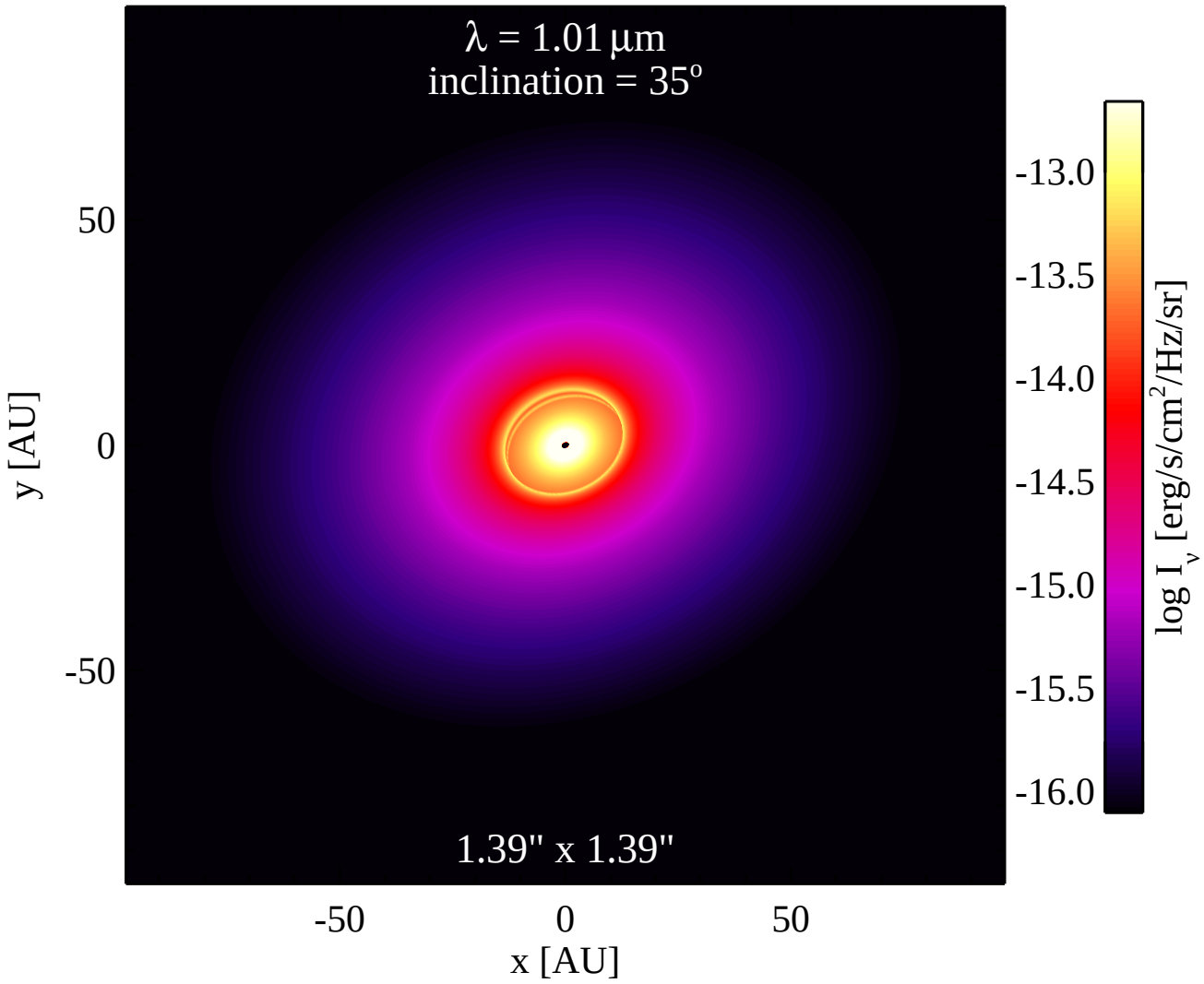

dist = 140.0 pc R = 600.0
CO
C
o-H2O
13CO
HCN
CN
HCO+
o-H2CO
HNC
C18O
p-H2CO
0.15
0.10
0.05
0.00
F_ν -F_ν^cont [Jy]
400
500
600
700
800
λ [μm]

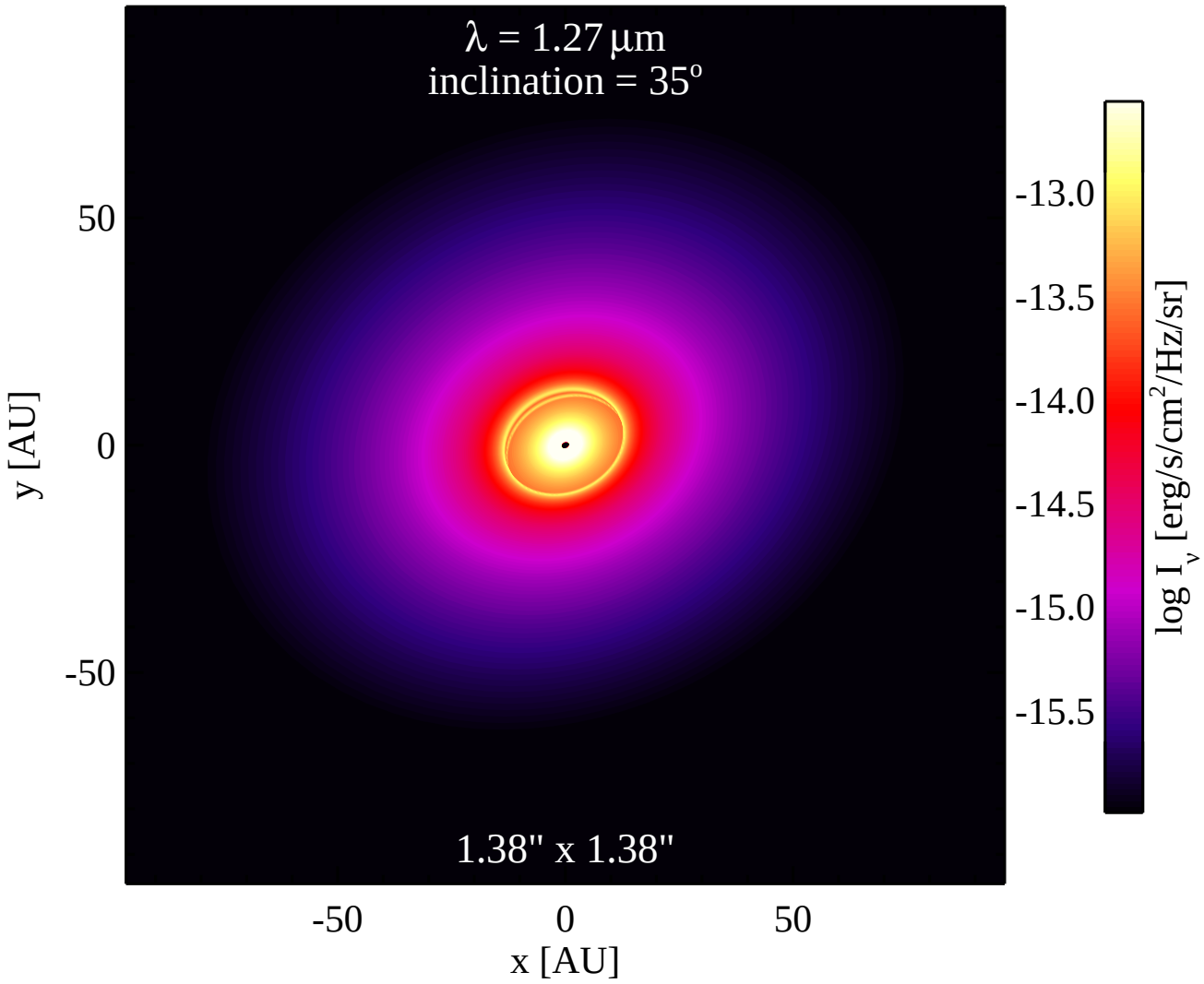

dist = 140.0 pc R = 600.0
CO 13CO SiO CS HCN CN HCOo-H2COHNC C18O p-H2CON2H+ C2Ho-C3H2
0.06
0.04
0.02
0.00
F_ν -F_ν^cont [Jy]
800
850
900
950
1000
λ [μm]

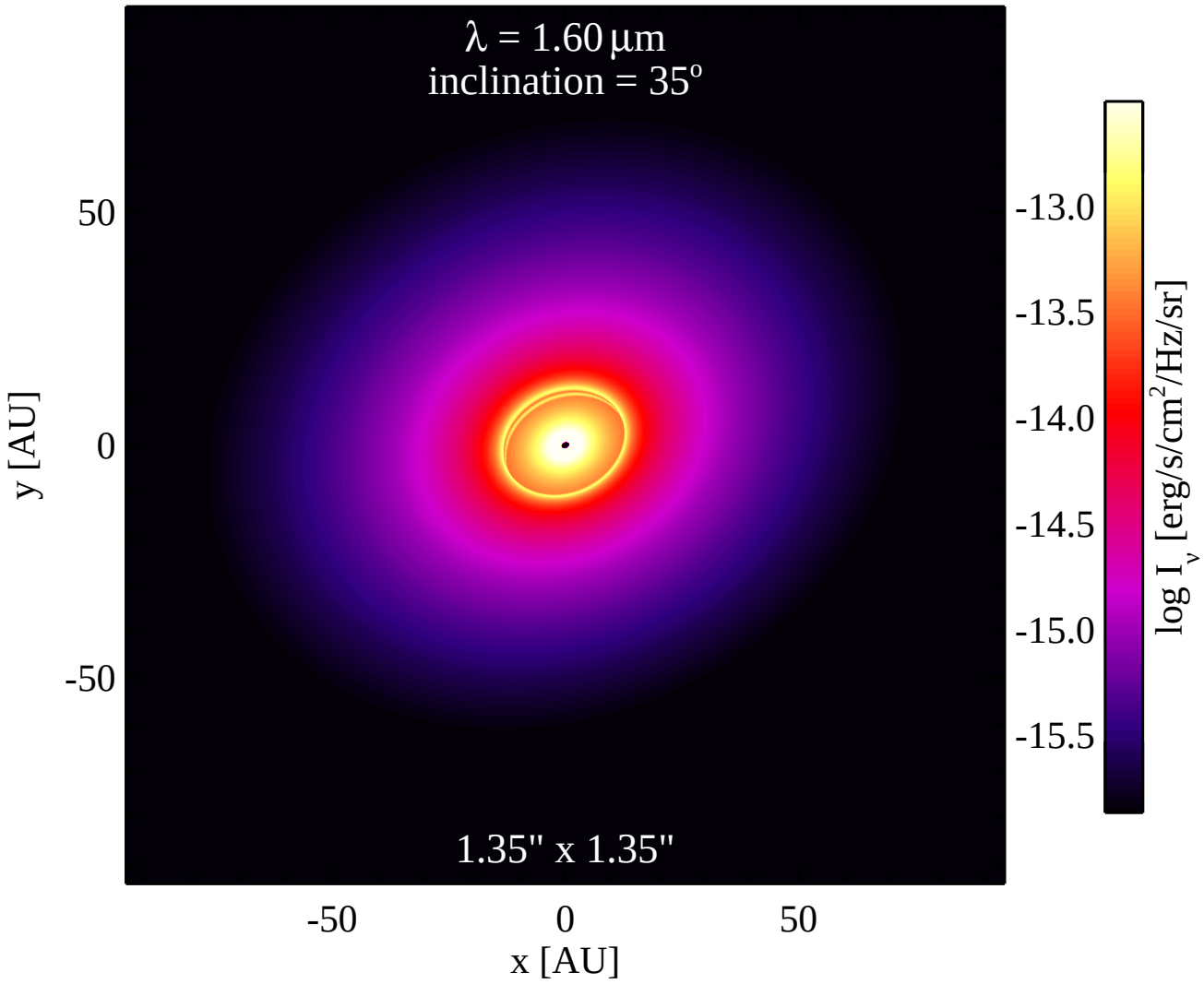

dist = 140.0 pc R = 600.0
CO 13CO SiO CS HCN CN HCO+ o-H2CO HNC C18O p-H2CO N2H+ C2H o-C3H2
0.03
0.02
0.01
0.00
F_ν -F_ν^cont [Jy]
1000
1100
1200
1300
1400
λ [μm]

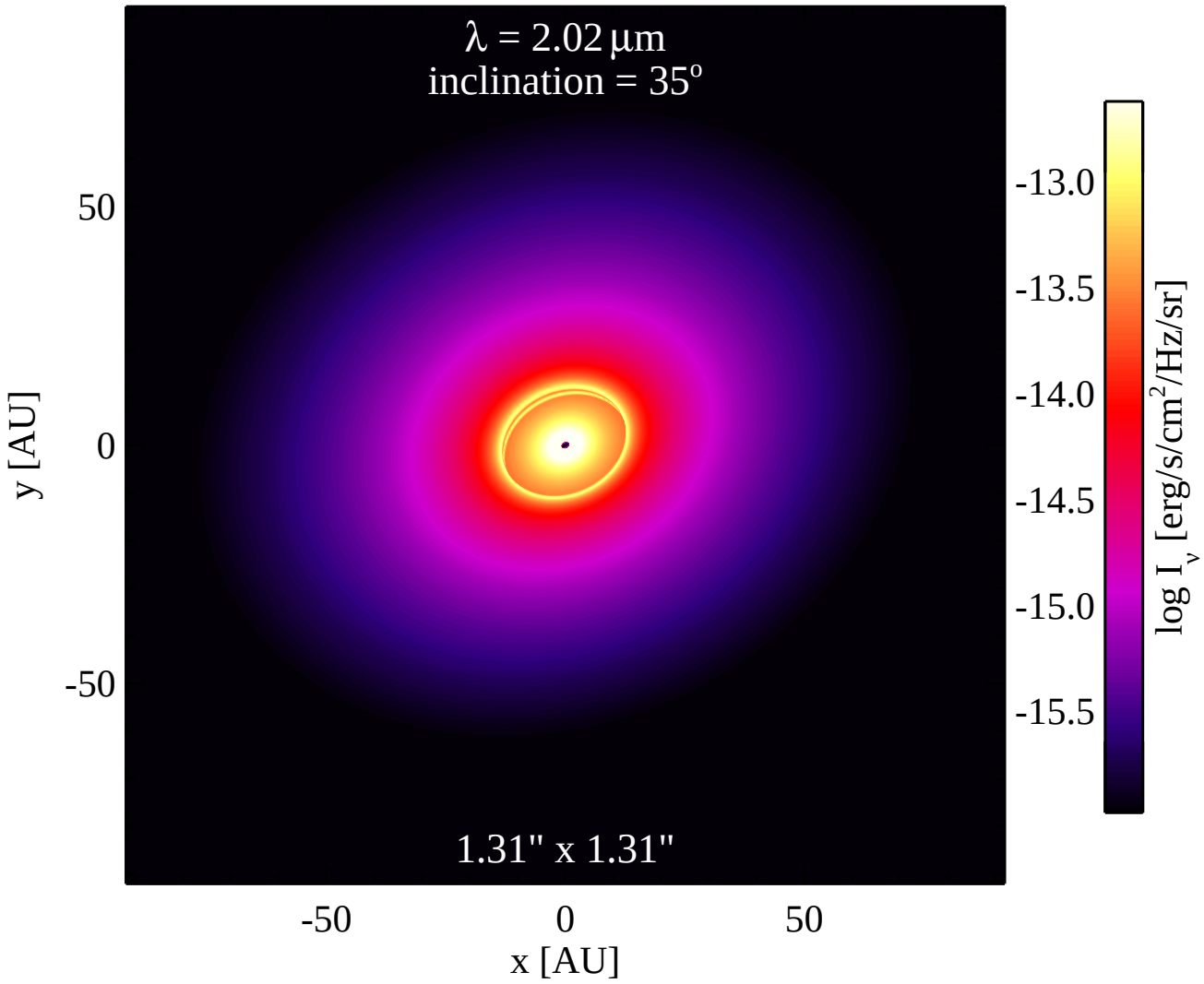

dist = 140.0 pc R = 600.0
o-H2CO
CS
HCN
HCO+
SiO
HNC
N2H+
C2H
o-C3H2
0.012
0.010
0.008
0.006
0.004
0.002
0.000
F_ν - F_ν^cont [Jy]
1400
1500
1600
1700
1800
1900
2000
λ [μm]

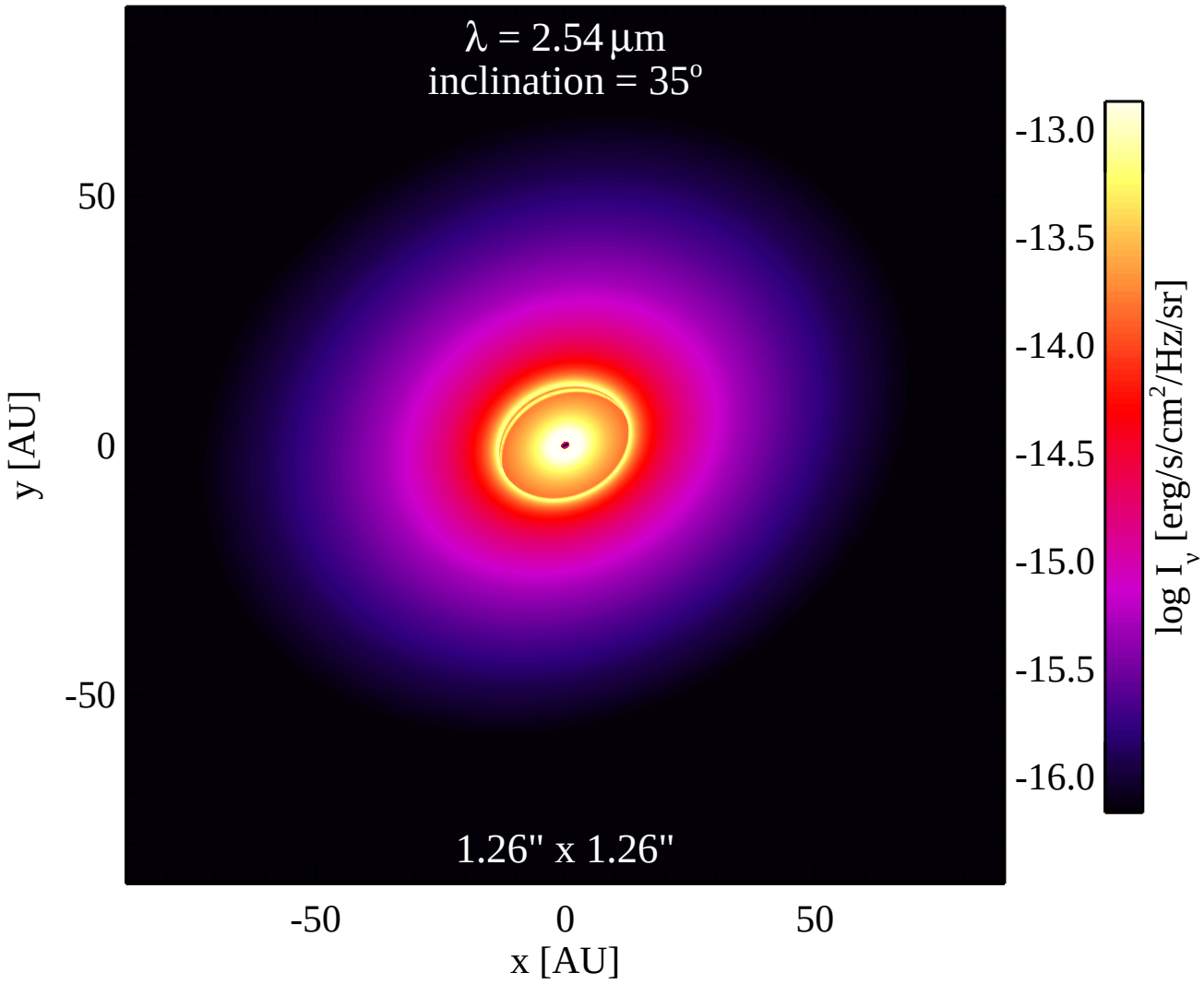

dist = 140.0 pc R = 600.0
p-H2CO
13CO
SiO
CS
CN
o-H2CO
CO
o-C3H2
0.006
0.004
0.002
0.000
F_ν - F_ν^cont [Jy]
2000
2200
2400
2600
2800
3000
λ [μm]

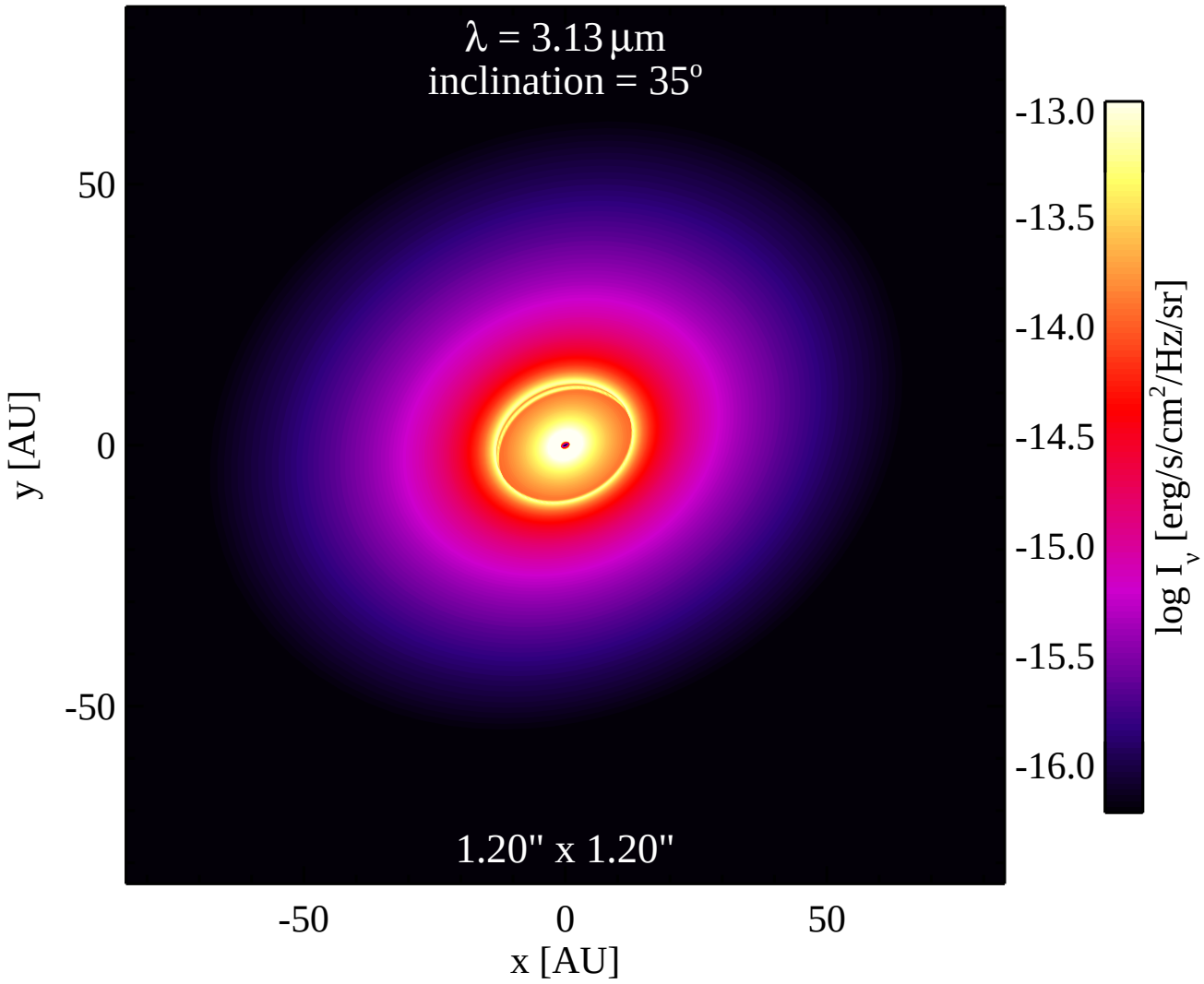

λ = 1.01 μm
inclination = 35°
1.39" x 1.39"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

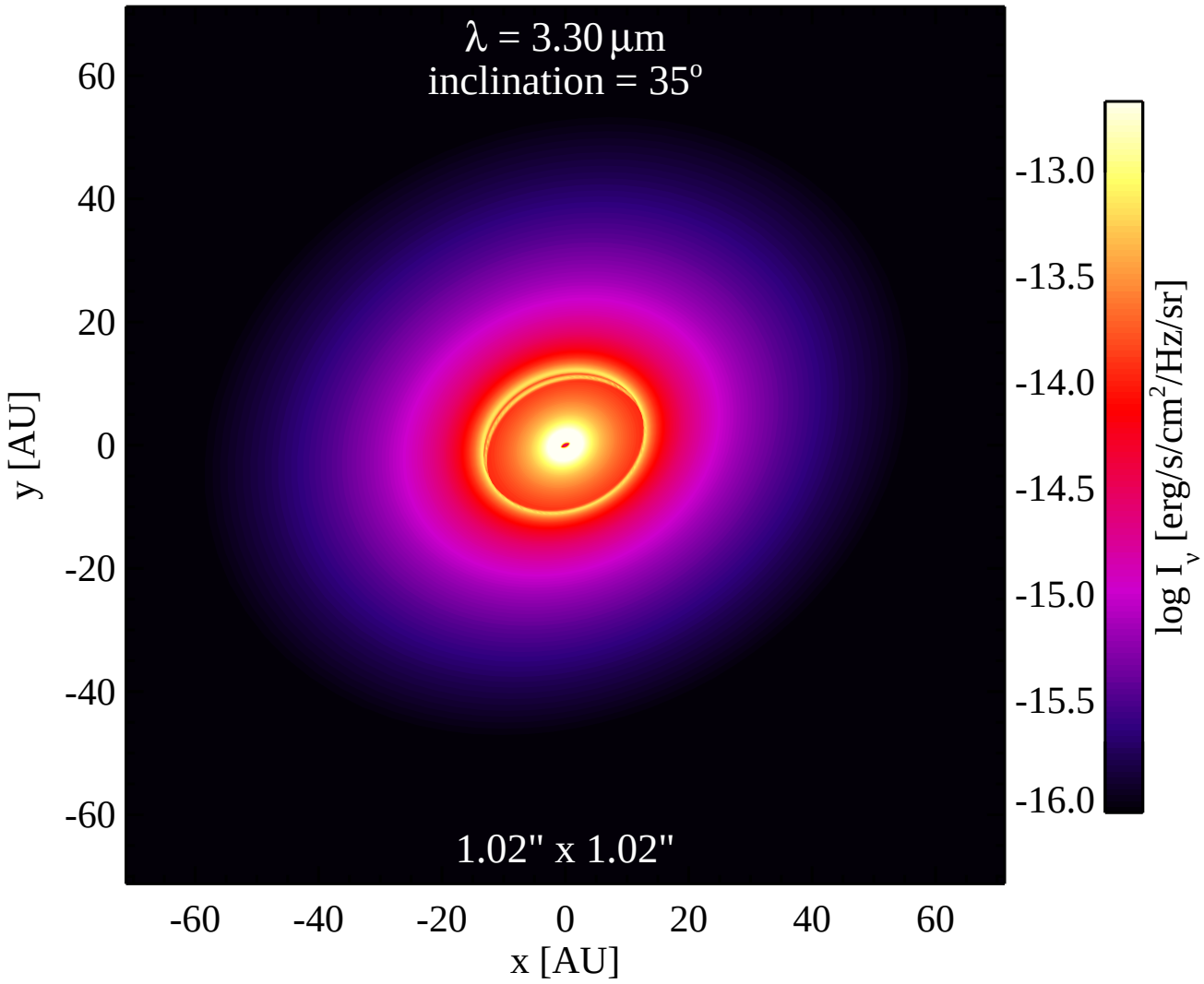

λ = 1.27 μm
inclination = 35°
1.38" x 1.38"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
log I_ν [erg/s/cm²/Hz/sr]

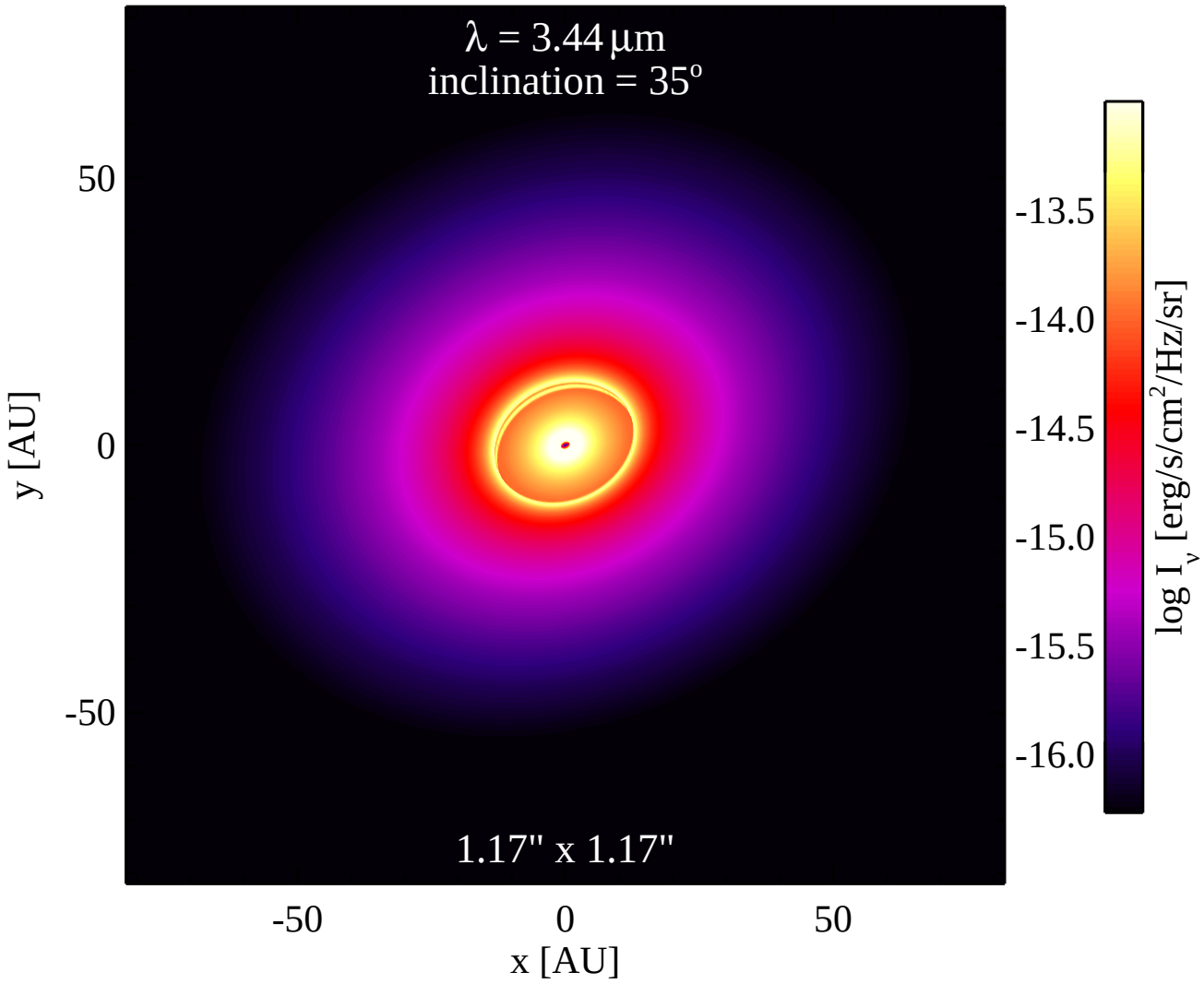

λ = 1.60 μm
inclination = 35°
1.35" x 1.35"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
log I_ν [erg/s/cm²/Hz/sr]

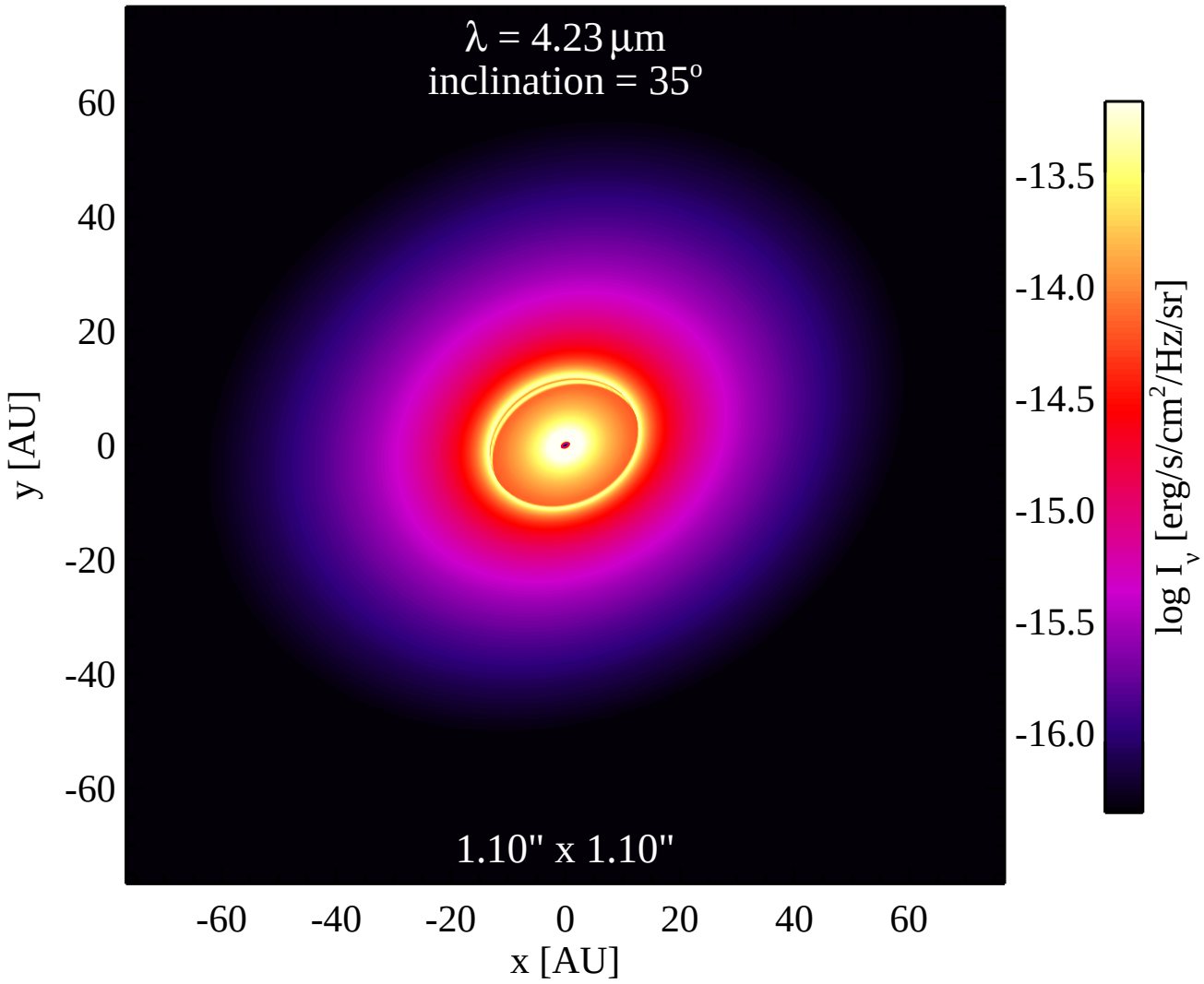

λ = 2.02 μm
inclination = 35°
1.31" x 1.31"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
log I_ν [erg/s/cm²/Hz/sr]

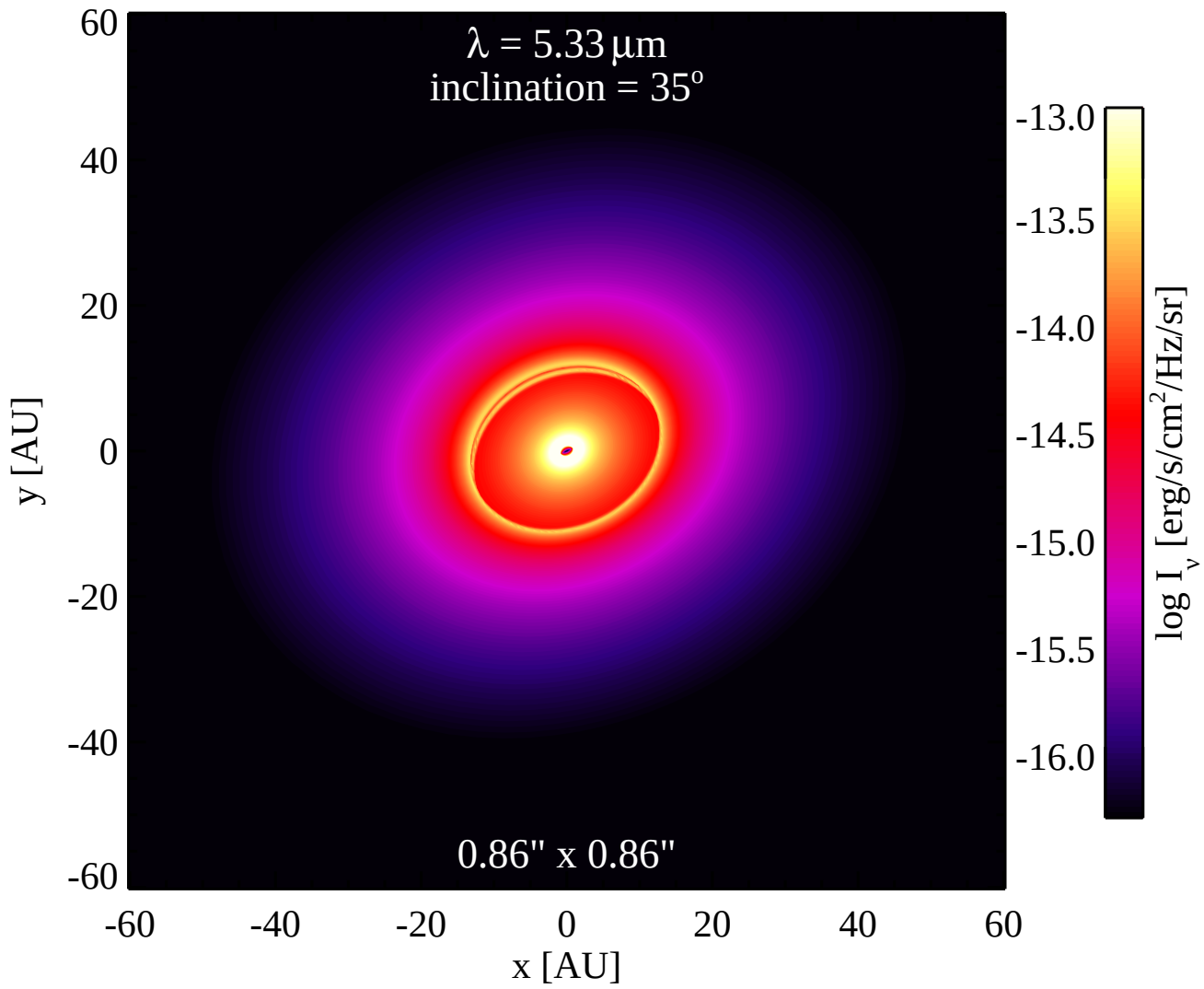

λ = 2.54 μm
inclination = 35°
1.26" x 1.26"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

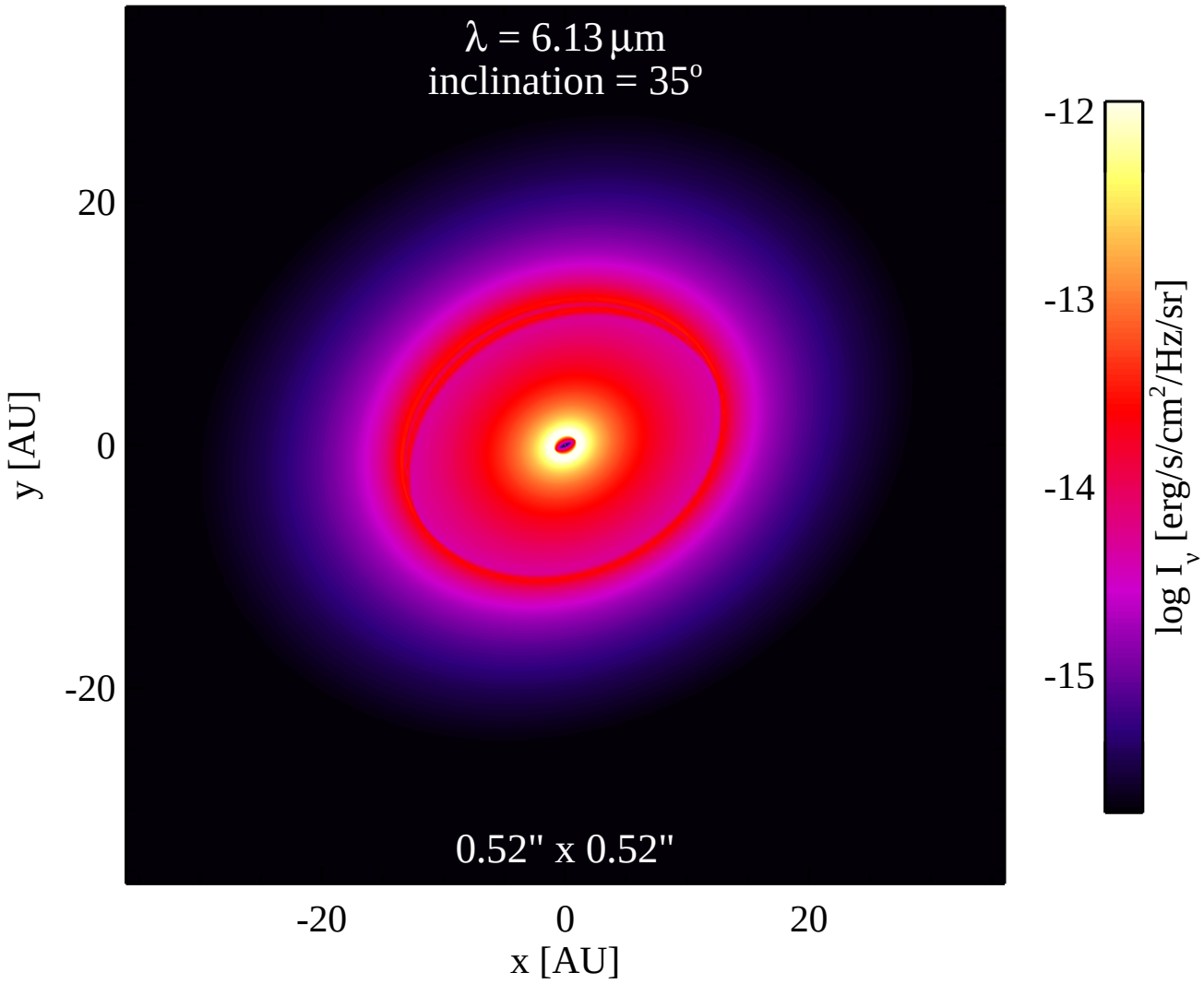

λ = 3.13 μm
inclination = 35°
1.20" x 1.20"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

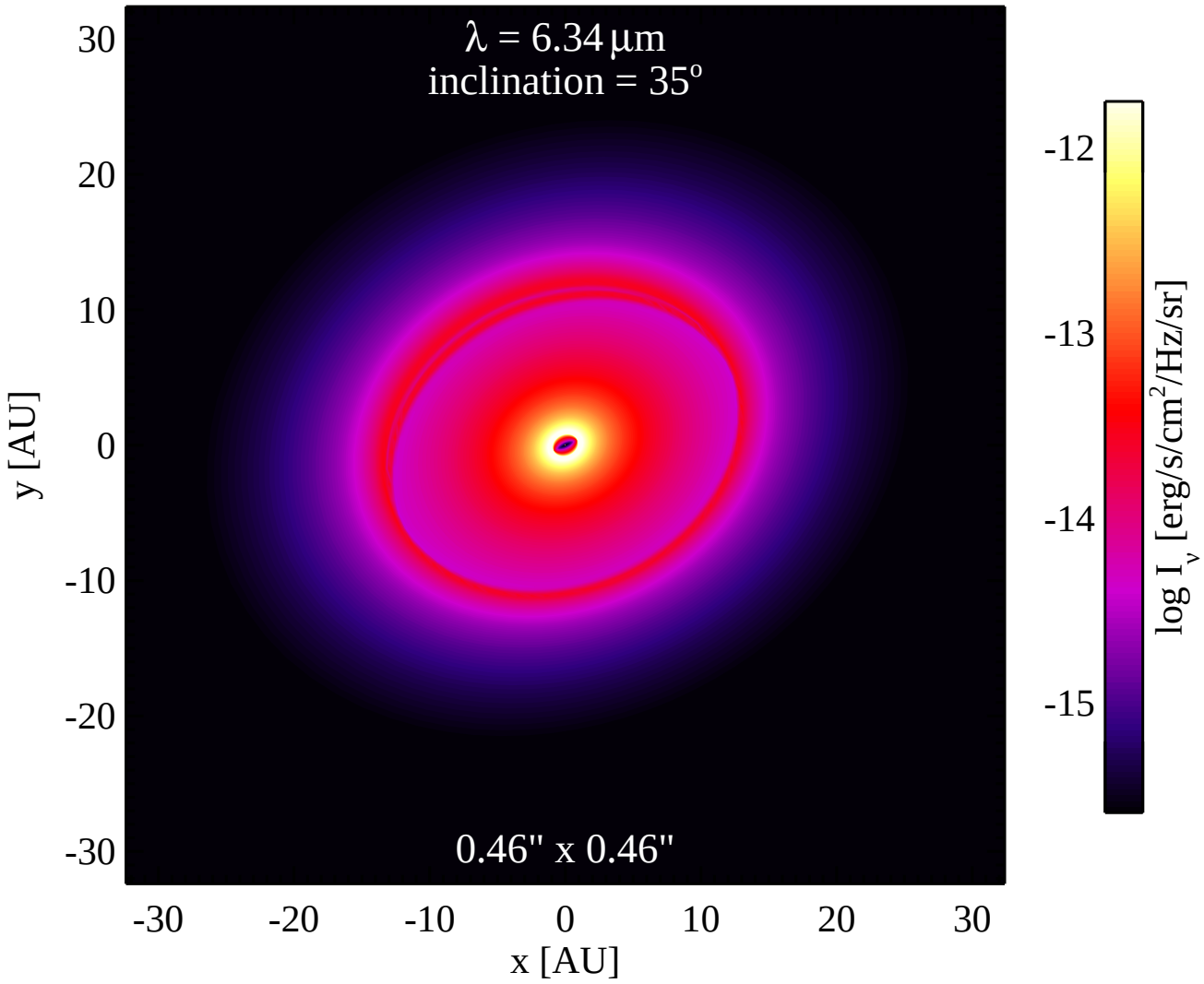

λ = 3.30 μm
inclination = 35°
1.02" x 1.02"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

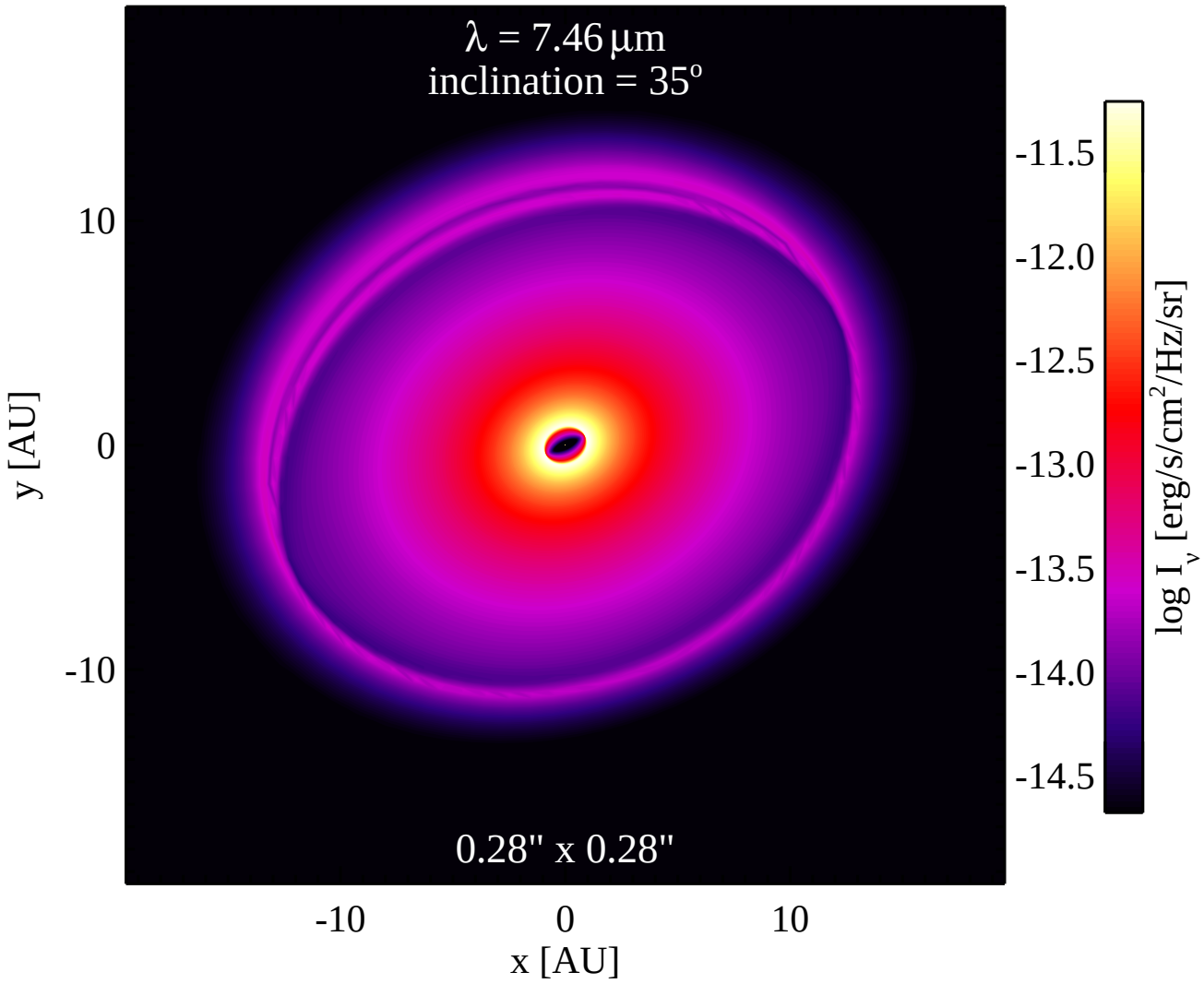

λ = 3.44 μm
inclination = 35°
1.17" x 1.17"
50
0
-50
y [AU]
-50
0
50
x [AU]
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

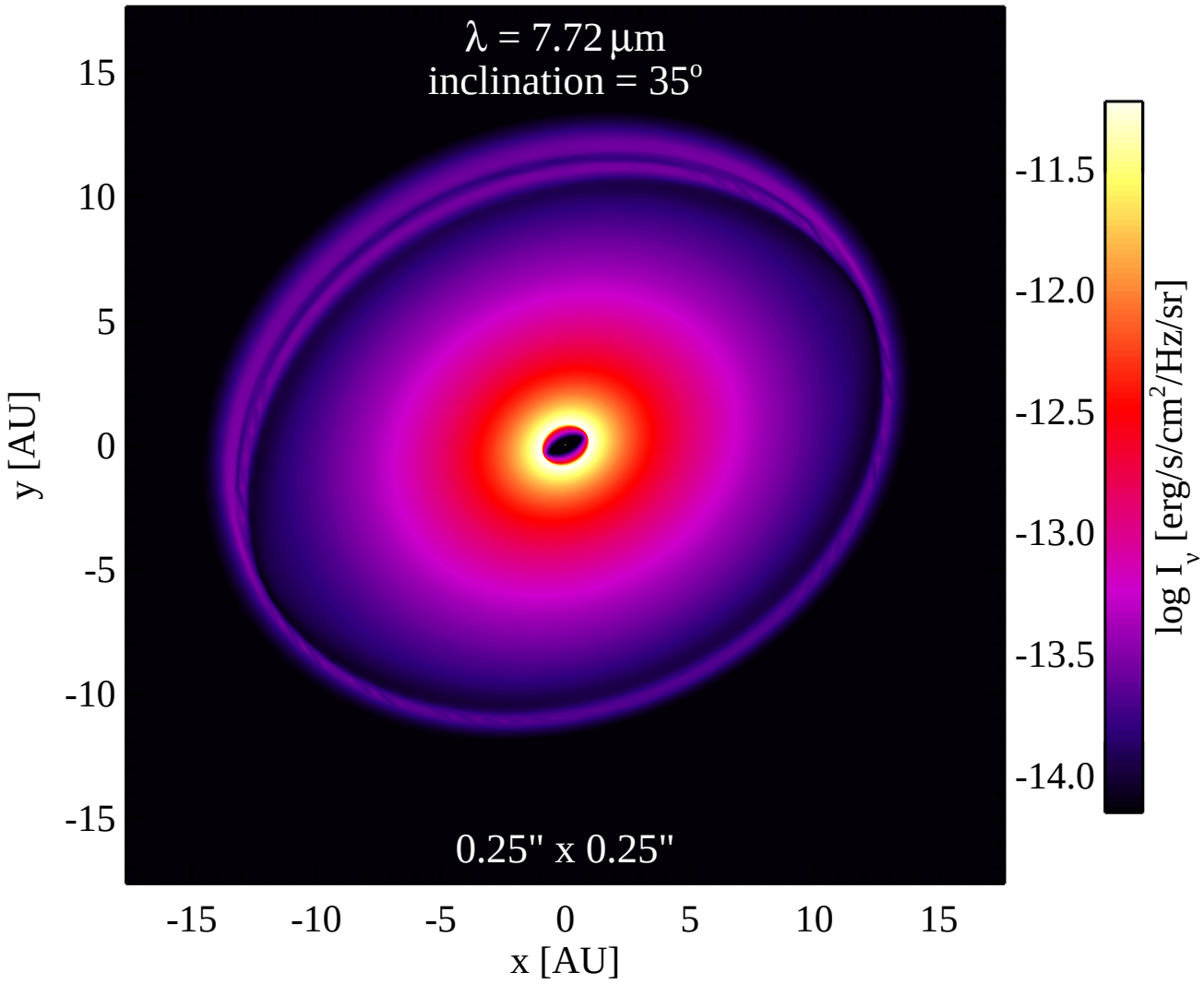

λ = 4.23 μm
inclination = 35°
1.10" x 1.10"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

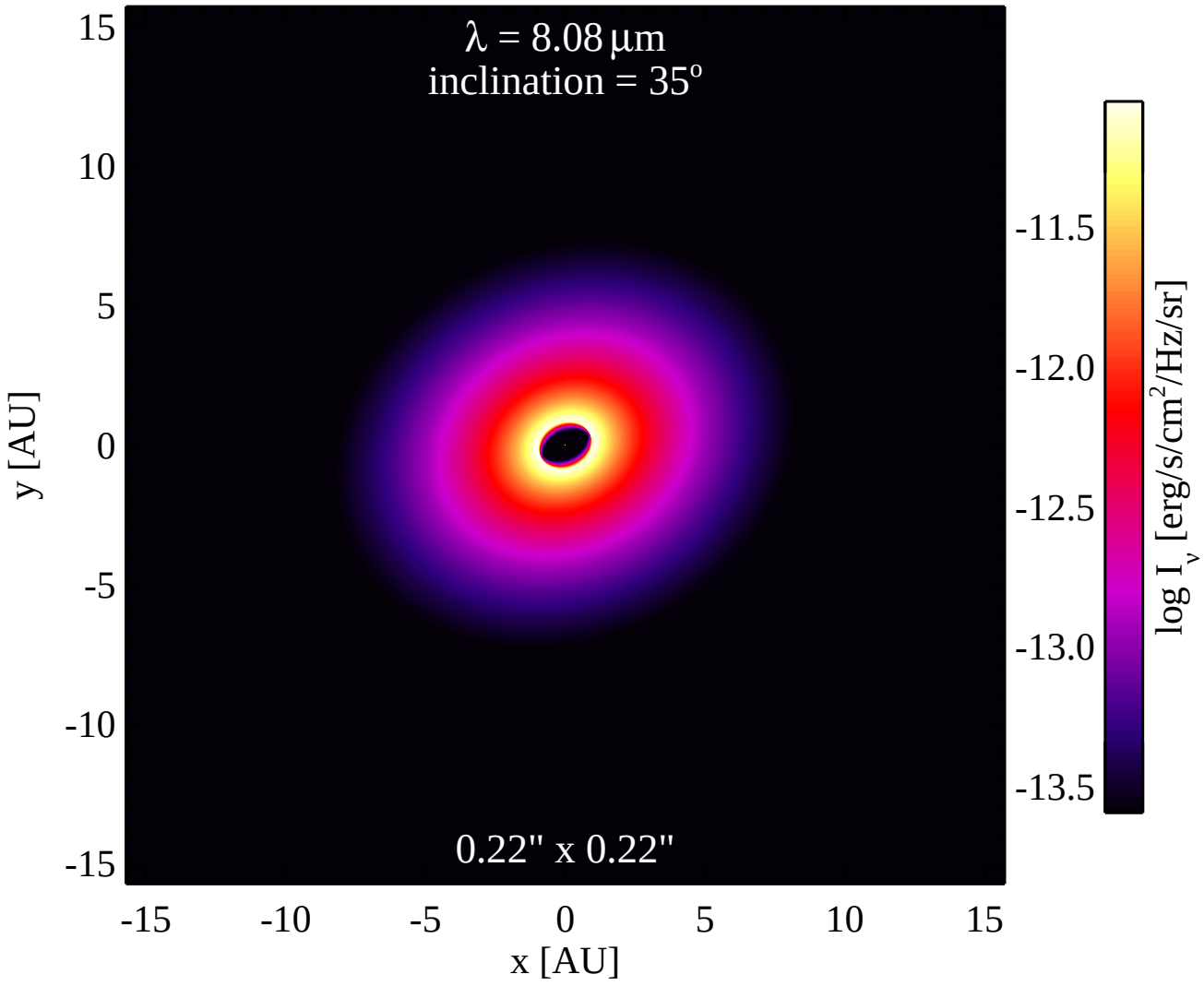

λ = 5.33 μm
inclination = 35°
0.86" x 0.86"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-13.0
-13.5
-14.0
-14.5
-15.0
-15.5
-16.0
log I_ν [erg/s/cm²/Hz/sr]

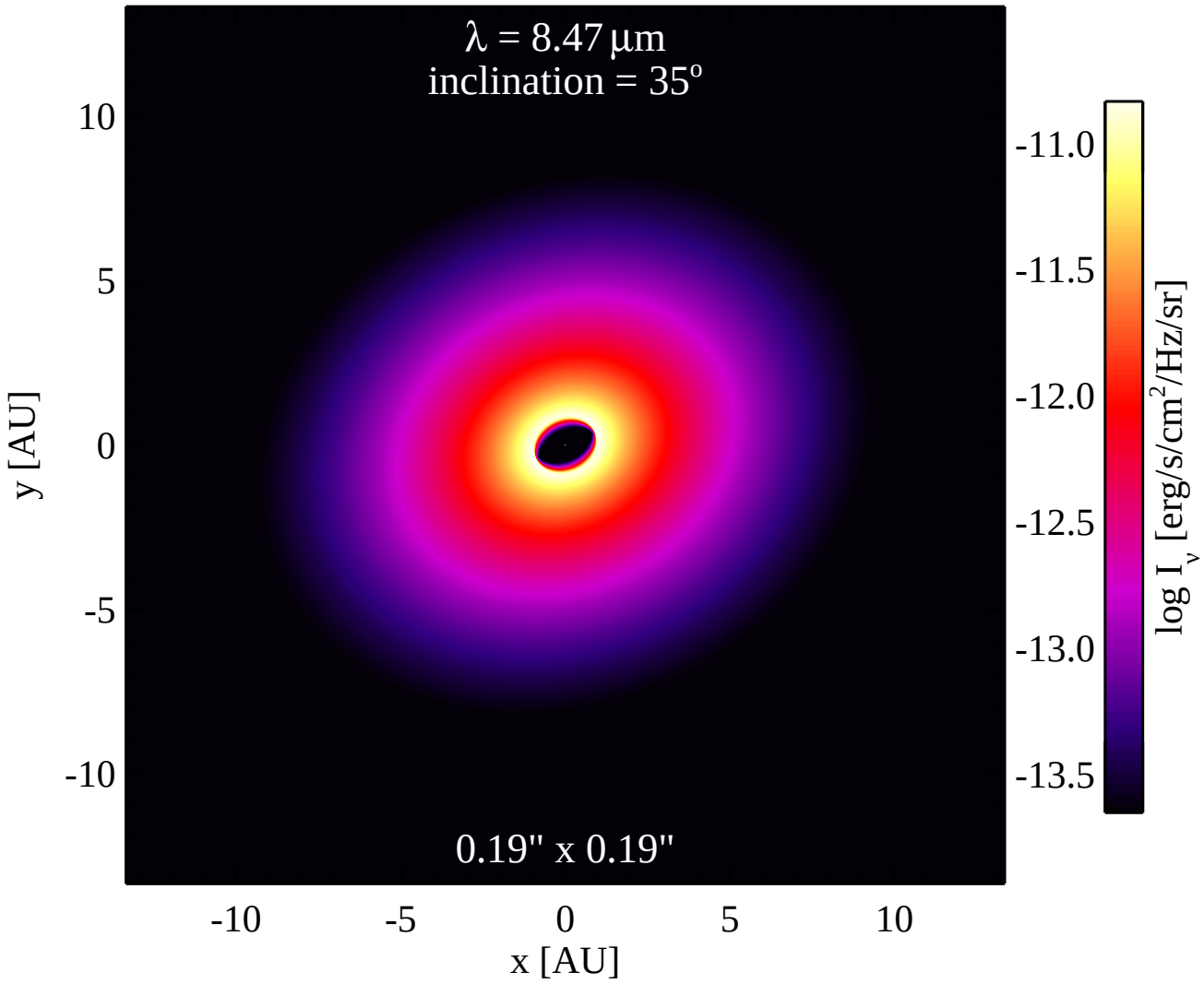

λ = 6.13 μm
inclination = 35°
0.52" x 0.52"
20
0
-20
y [AU]
-20
0
20
x [AU]
-12
-13
-14
-15
log I_ν [erg/s/cm²/Hz/sr]

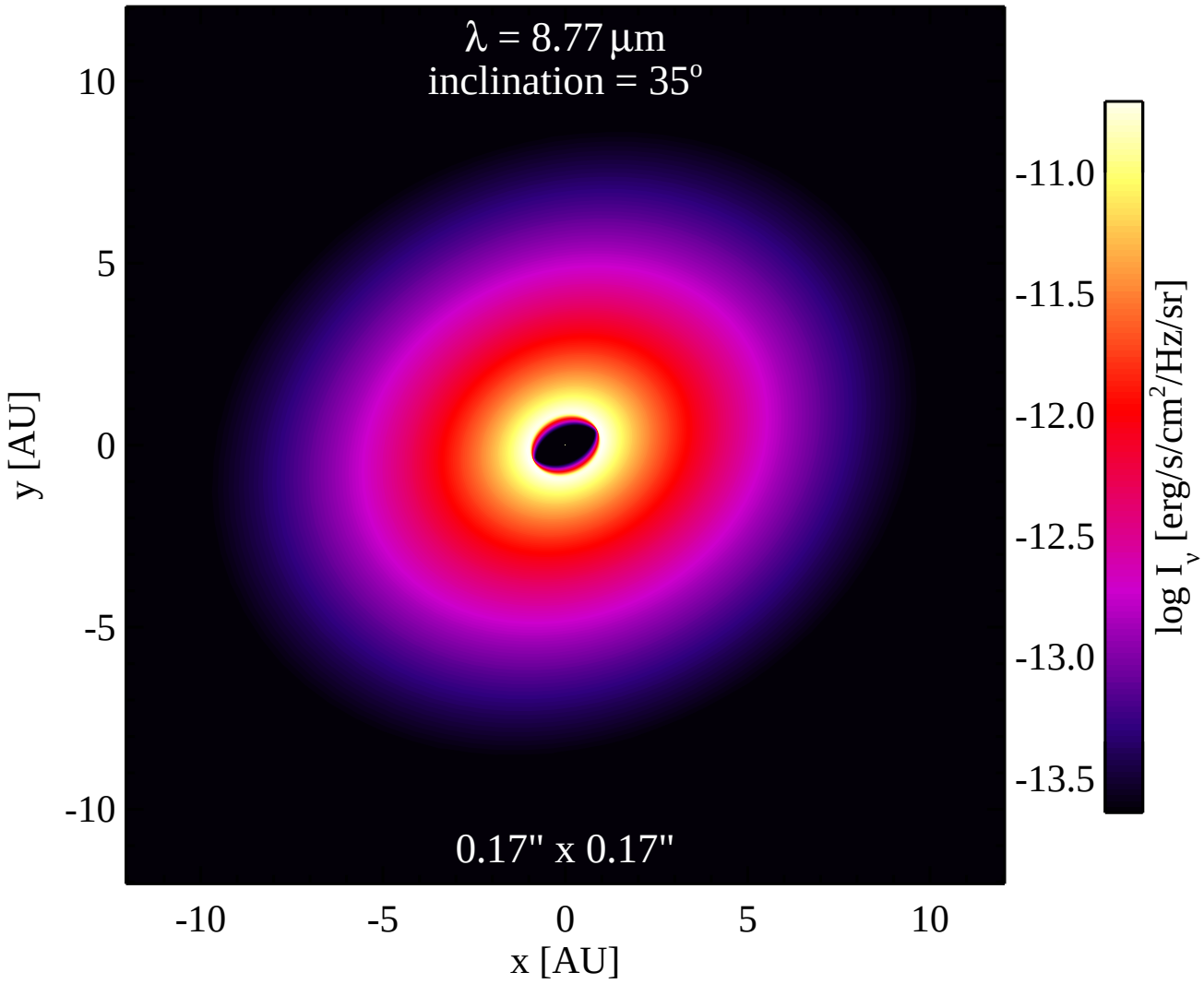

λ = 6.34 μm
inclination = 35°
0.46" x 0.46"
30
20
10
0
-10
-20
-30
y [AU]
-30
-20
-10
0
10
20
30
x [AU]
-12
-13
-14
-15
log I_ν [erg/s/cm²/Hz/sr]

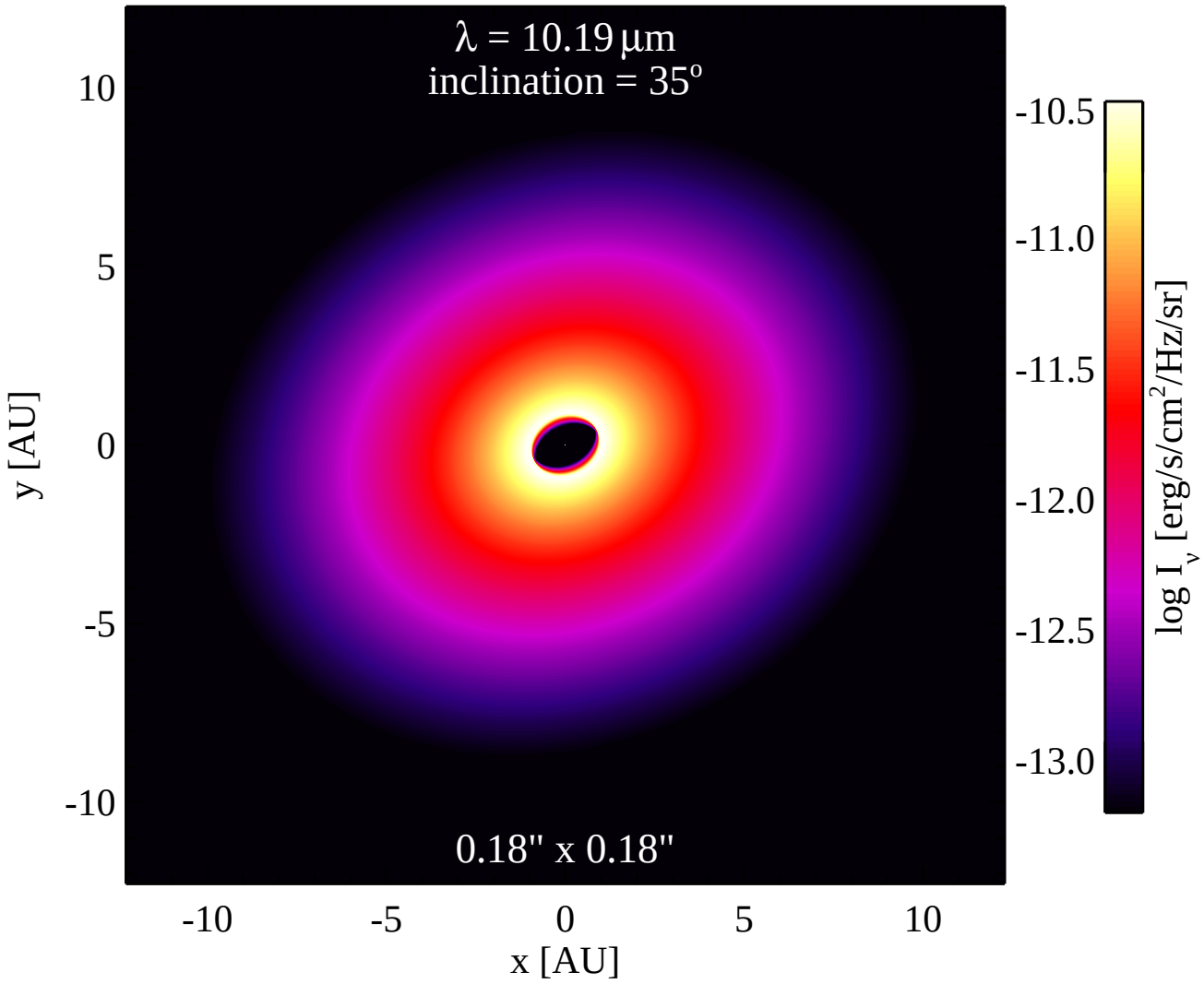

λ = 7.46 μm
inclination = 35°
0.28" x 0.28"
10
0
-10
y [AU]
-10
0
10
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

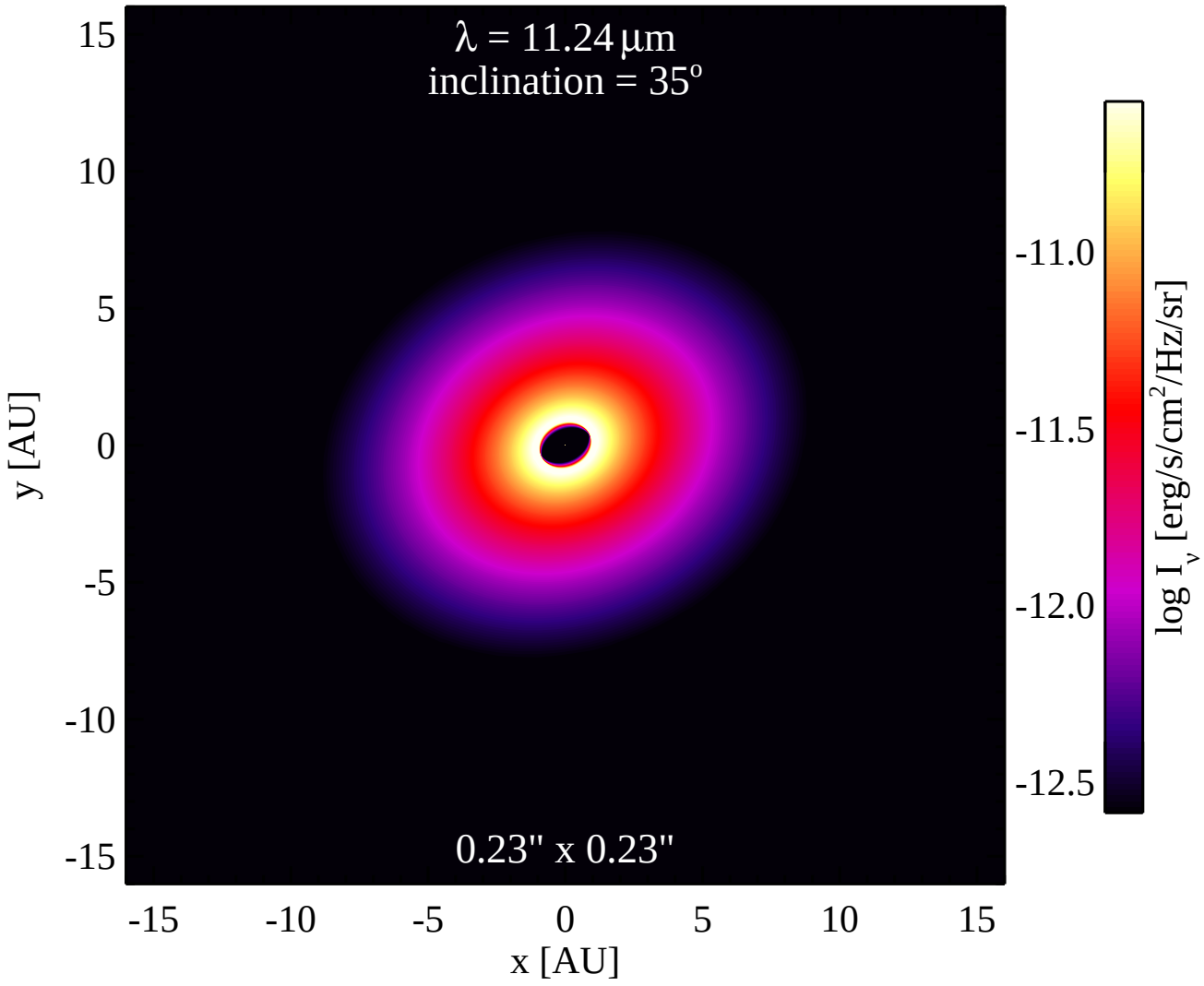

λ = 7.72 μm
inclination = 35°
0.25" x 0.25"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
-14.0
log I_ν [erg/s/cm²/Hz/sr]

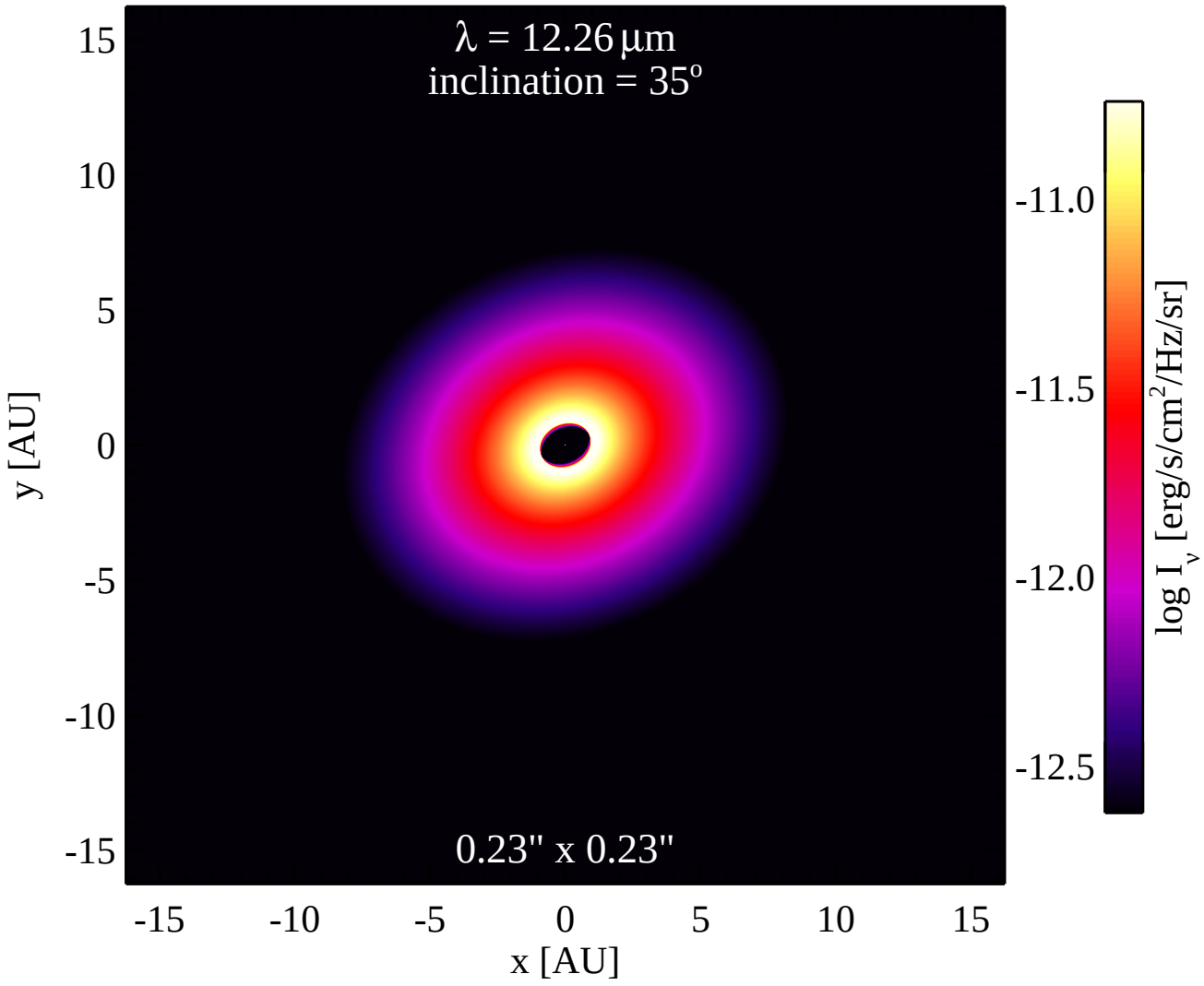

λ = 8.08 μm
inclination = 35°
0.22" x 0.22"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

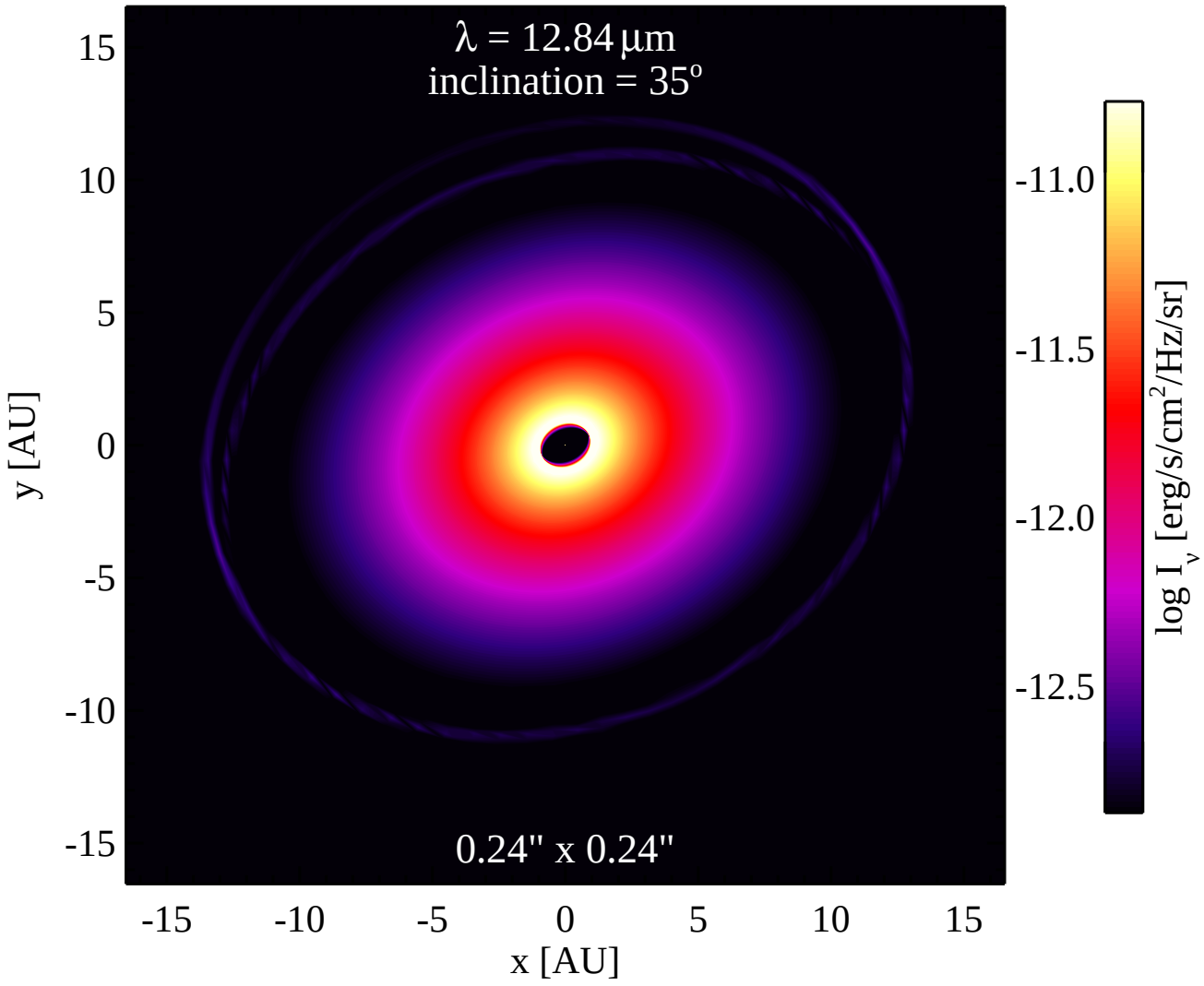

λ = 8.47 μm
inclination = 35°
0.19" x 0.19"
10
5
0
-5
-10
y [AU]
-10
-5
0
5
10
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

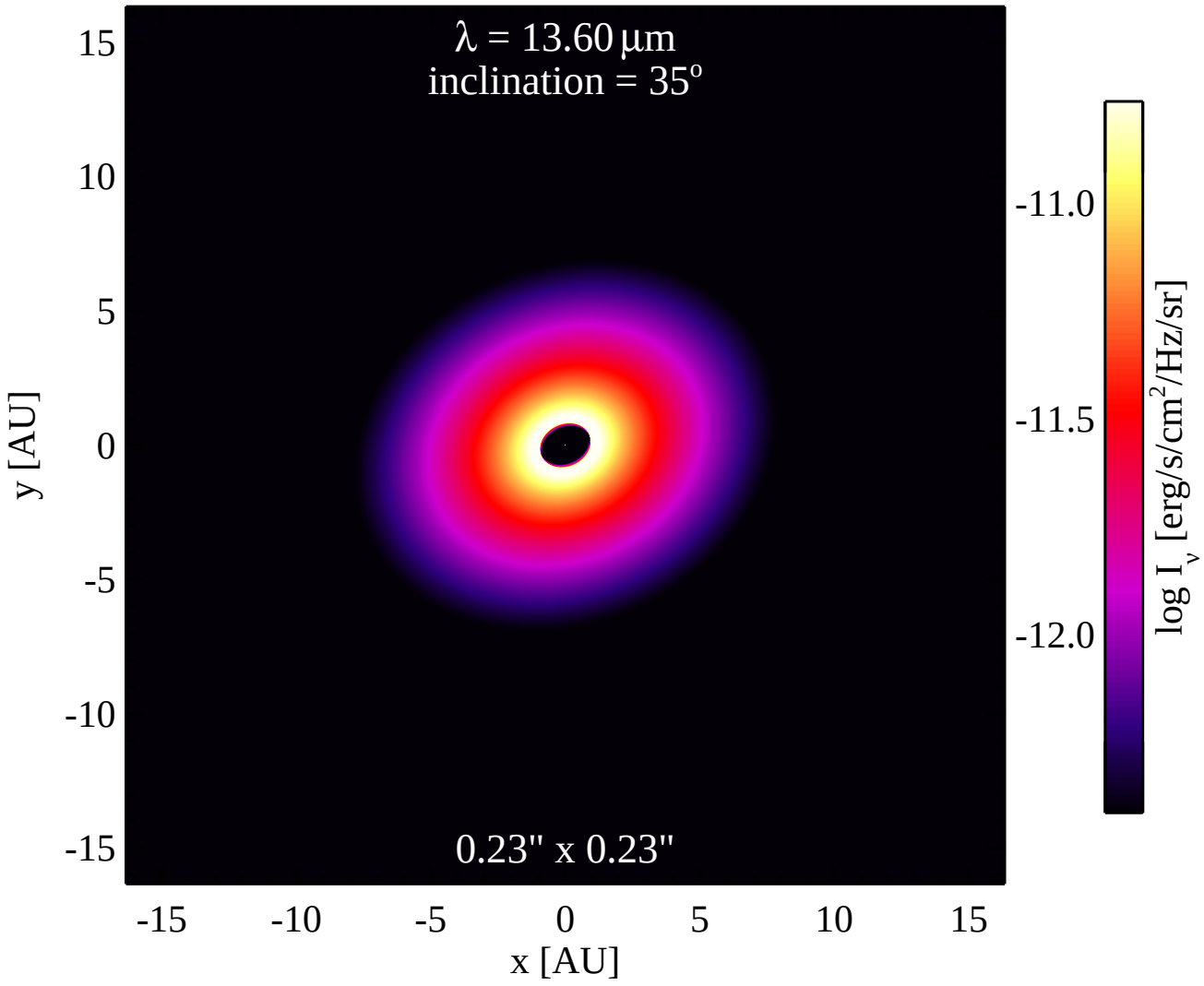

λ = 8.77 μm
inclination = 35°
0.17" x 0.17"
10
5
0
-5
-10
y [AU]
-10
-5
0
5
10
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

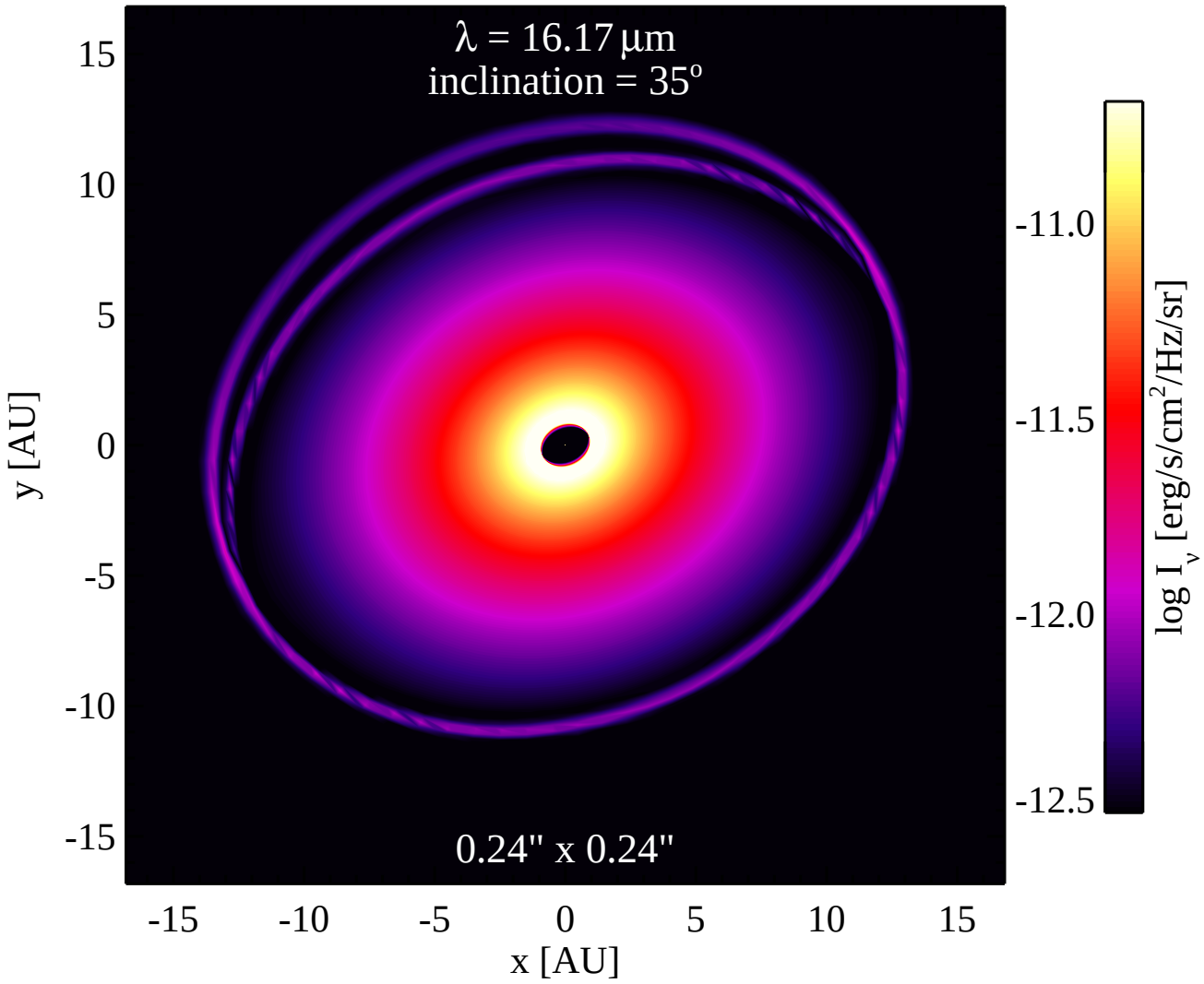

λ = 10.19 μm
inclination = 35°
0.18" x 0.18"
10
5
0
-5
-10
y [AU]
-10
-5
0
5
10
x [AU]
-10.5
-11.0
-11.5
-12.0
-12.5
-13.0
log I_ν [erg/s/cm²/Hz/sr]

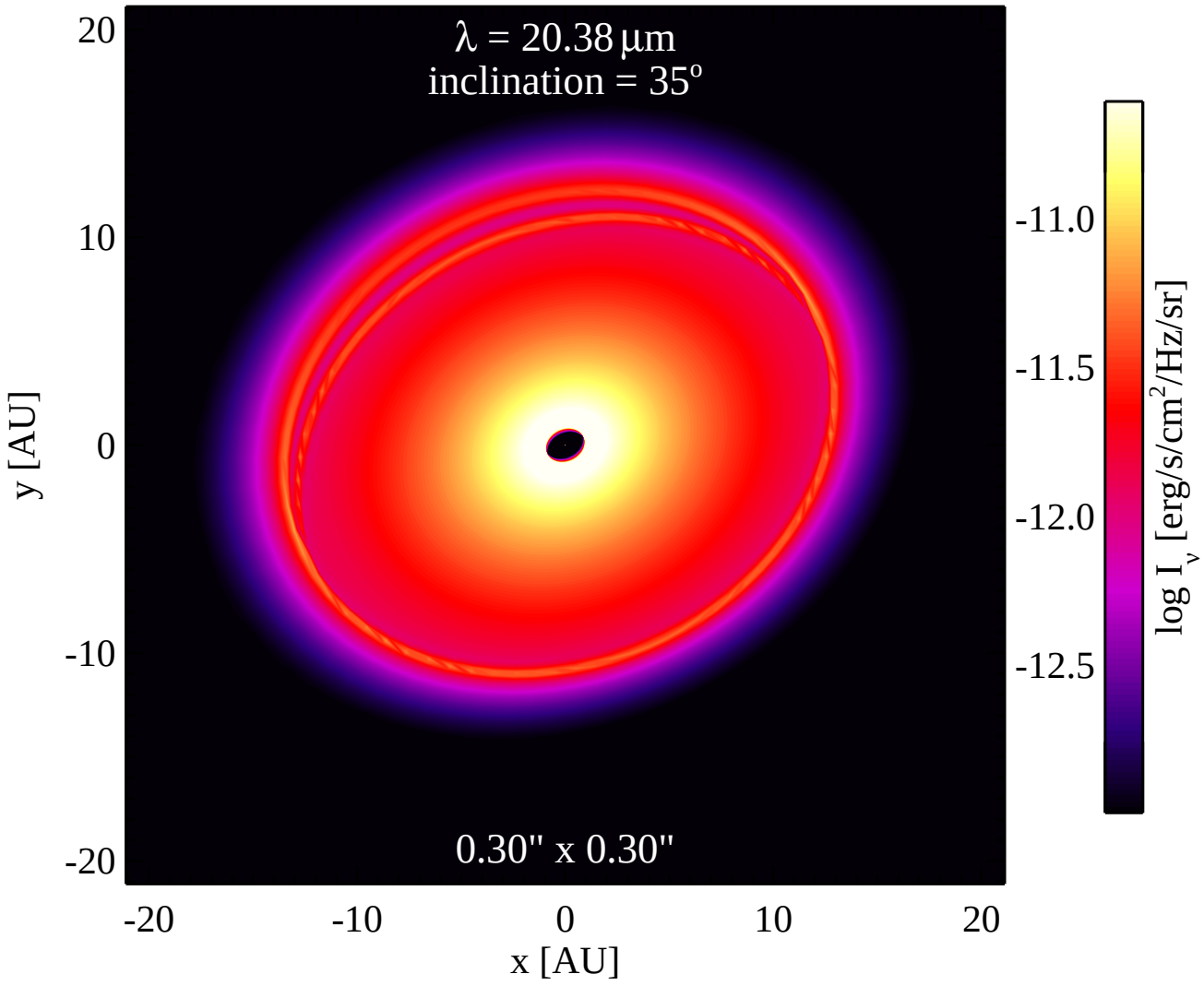

λ = 11.24 μm
inclination = 35°
0.23" x 0.23"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.0
-11.5
-12.0
-12.5
log I_ν [erg/s/cm²/Hz/sr]

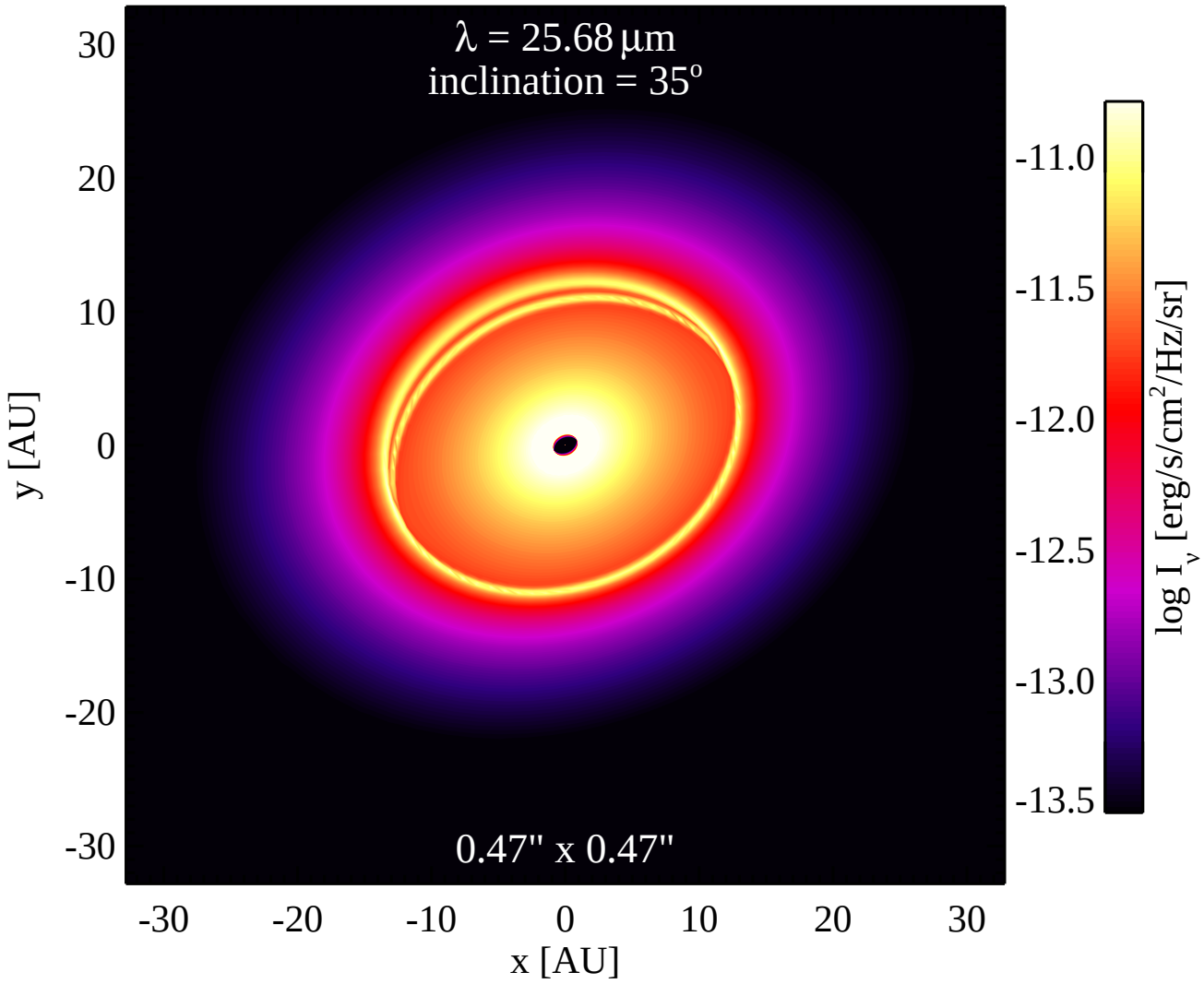

λ = 12.26 μm
inclination = 35°
0.23" x 0.23"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.0
-11.5
-12.0
-12.5
log I_ν [erg/s/cm²/Hz/sr]

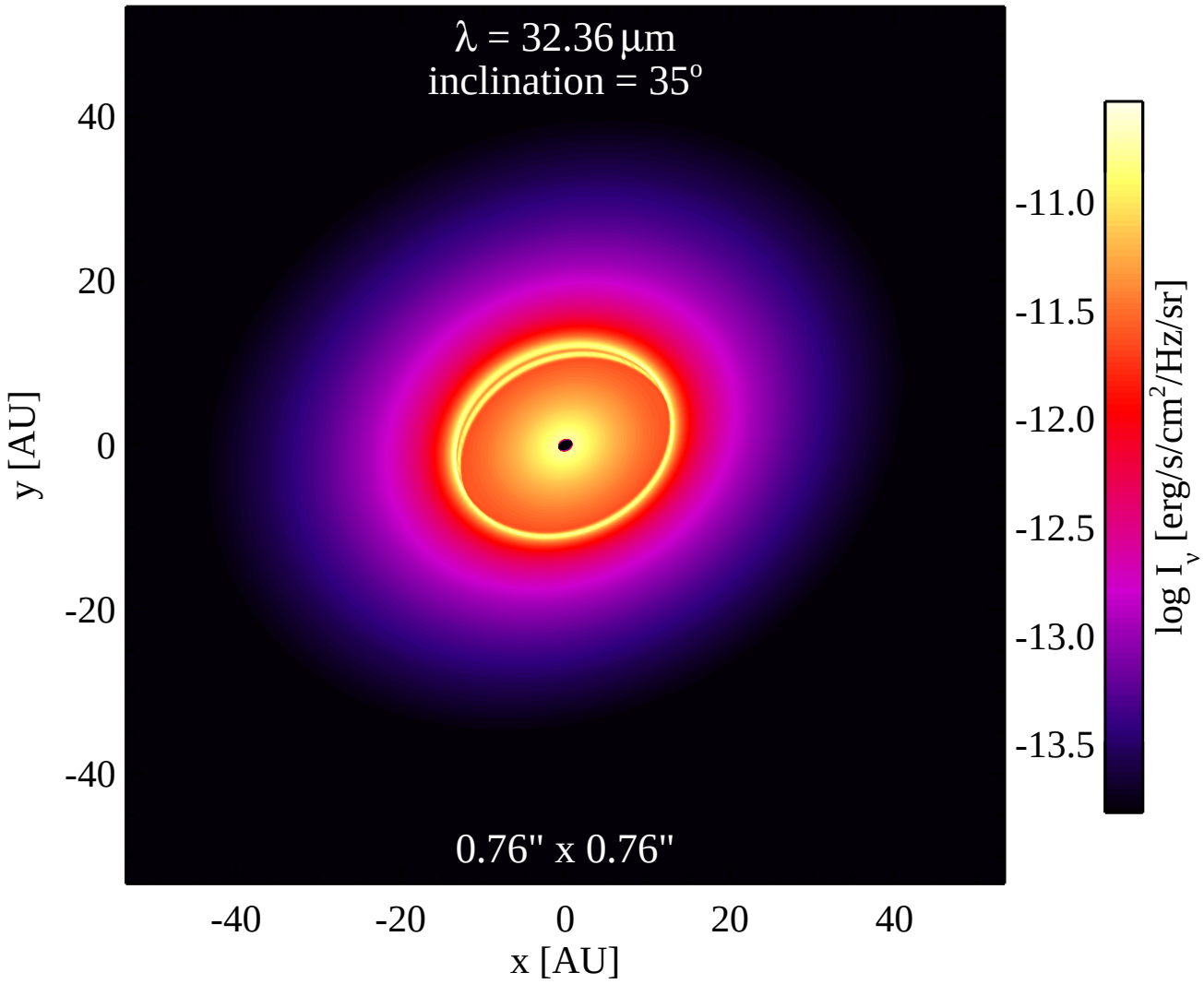

λ = 12.84 μm
inclination = 35°
0.24" x 0.24"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.0
-11.5
-12.0
-12.5
log I_ν [erg/s/cm²/Hz/sr]

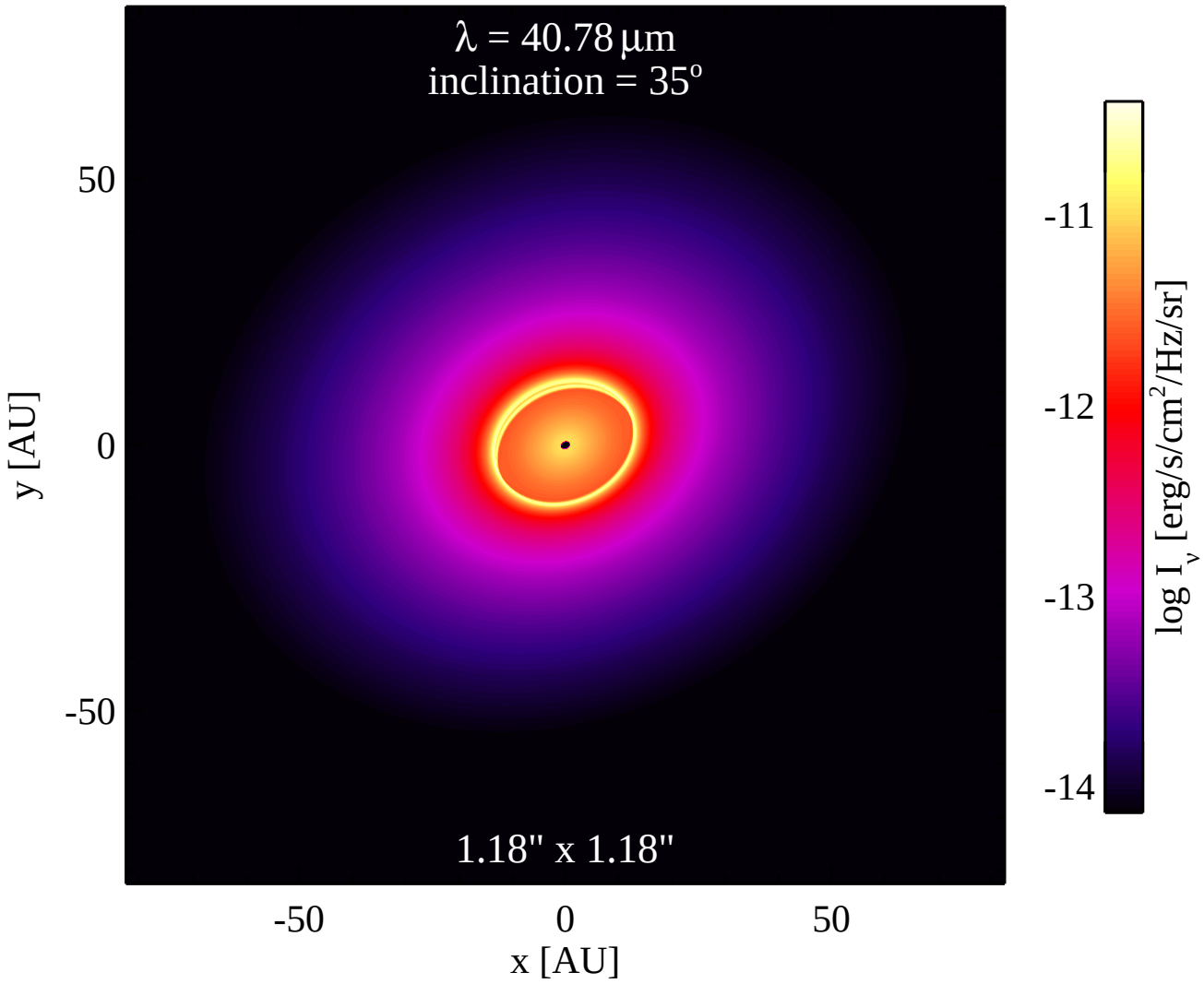

λ = 13.60 μm
inclination = 35°
0.23" x 0.23"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.0
-11.5
-12.0
log I_ν [erg/s/cm²/Hz/sr]

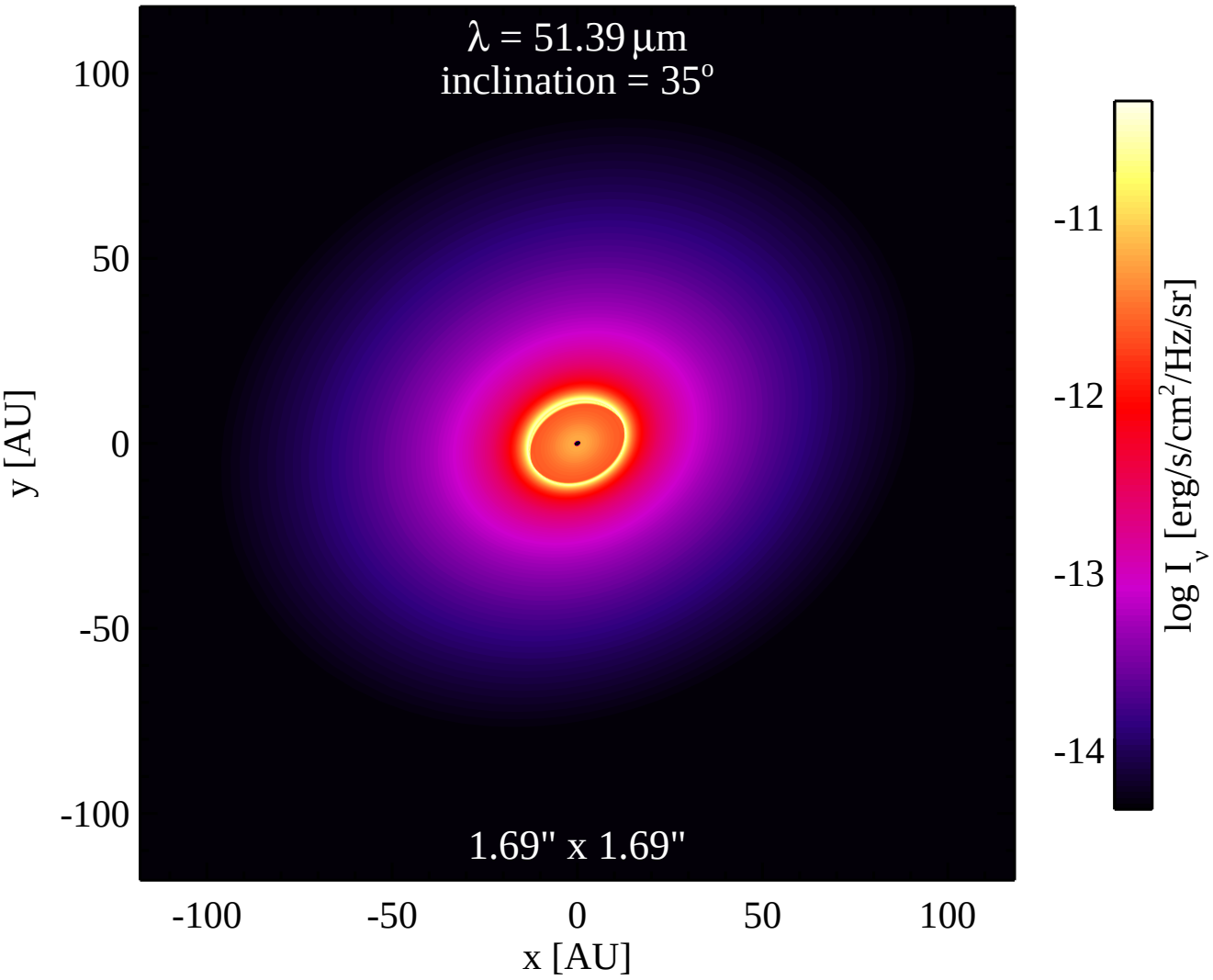

λ = 16.17 μm
inclination = 35°
0.24" x 0.24"
15
10
5
0
-5
-10
-15
y [AU]
-15
-10
-5
0
5
10
15
x [AU]
-11.0
-11.5
-12.0
-12.5
log I_ν [erg/s/cm²/Hz/sr]

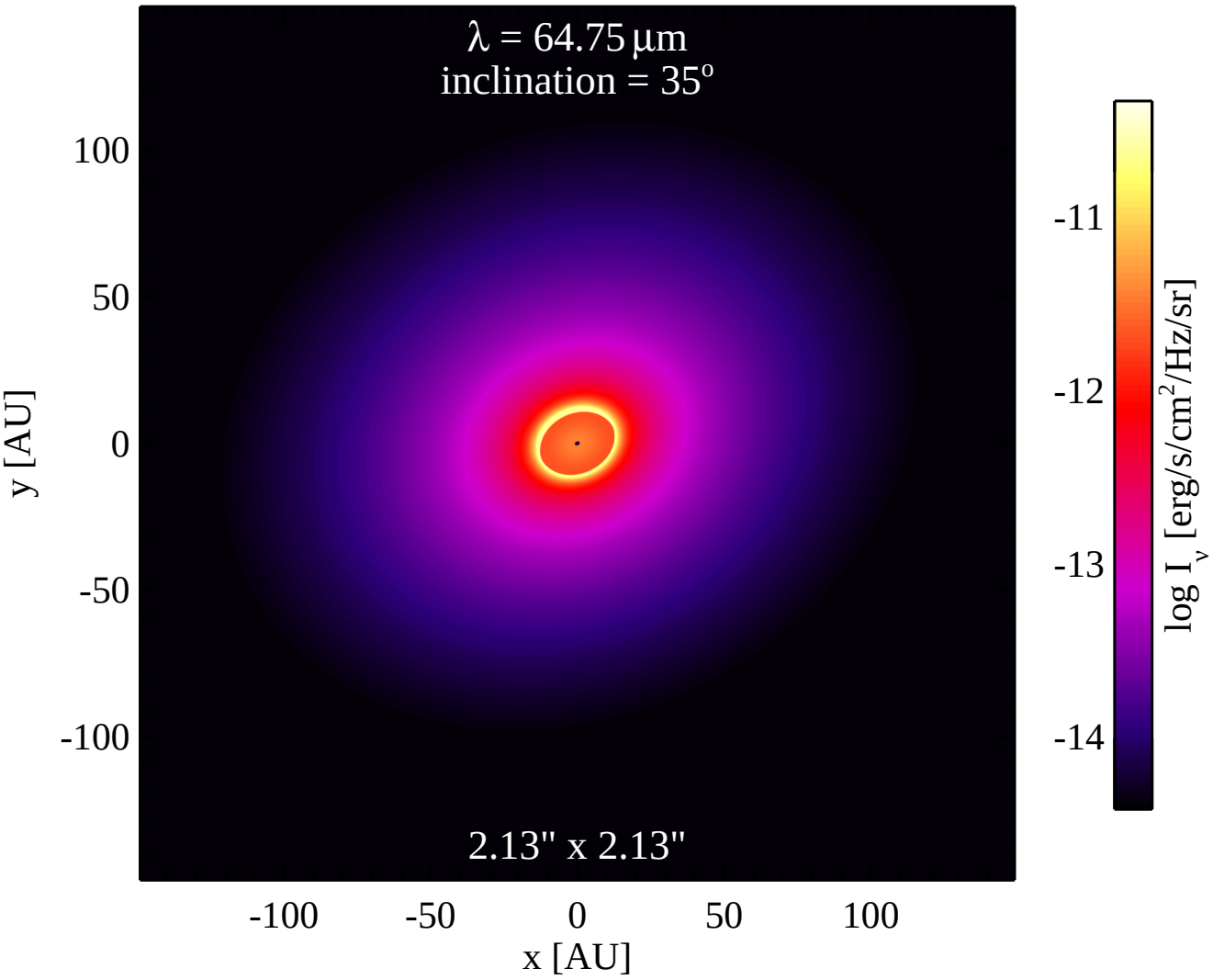

λ = 20.38 μm
inclination = 35°
0.30" x 0.30"
20
10
0
-10
-20
y [AU]
-20
-10
0
10
20
x [AU]
-11.0
-11.5
-12.0
-12.5
log I_ν [erg/s/cm²/Hz/sr]

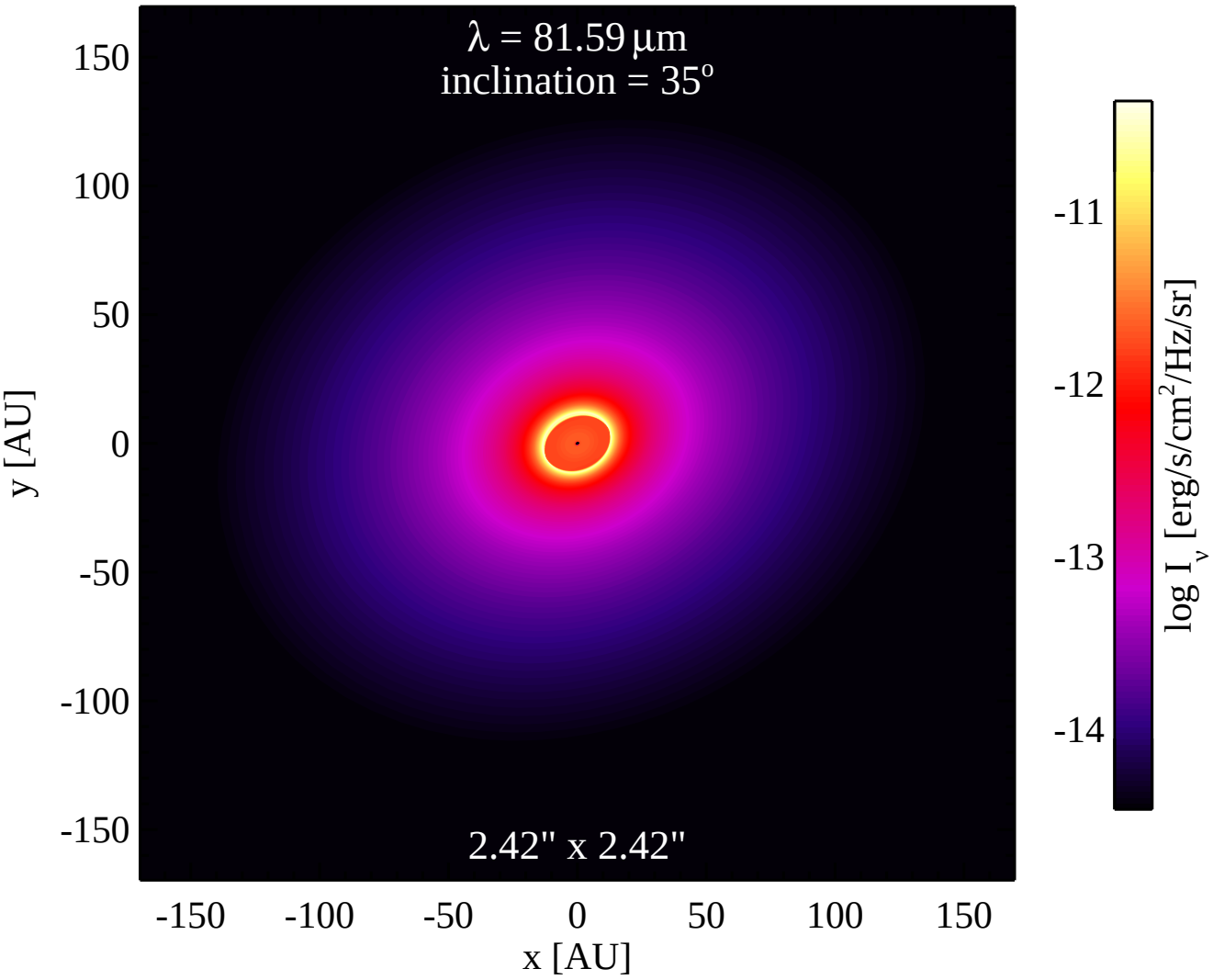

λ = 25.68 μm
inclination = 35°
0.47" x 0.47"
30
20
10
0
-10
-20
-30
y [AU]
-30
-20
-10
0
10
20
30
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

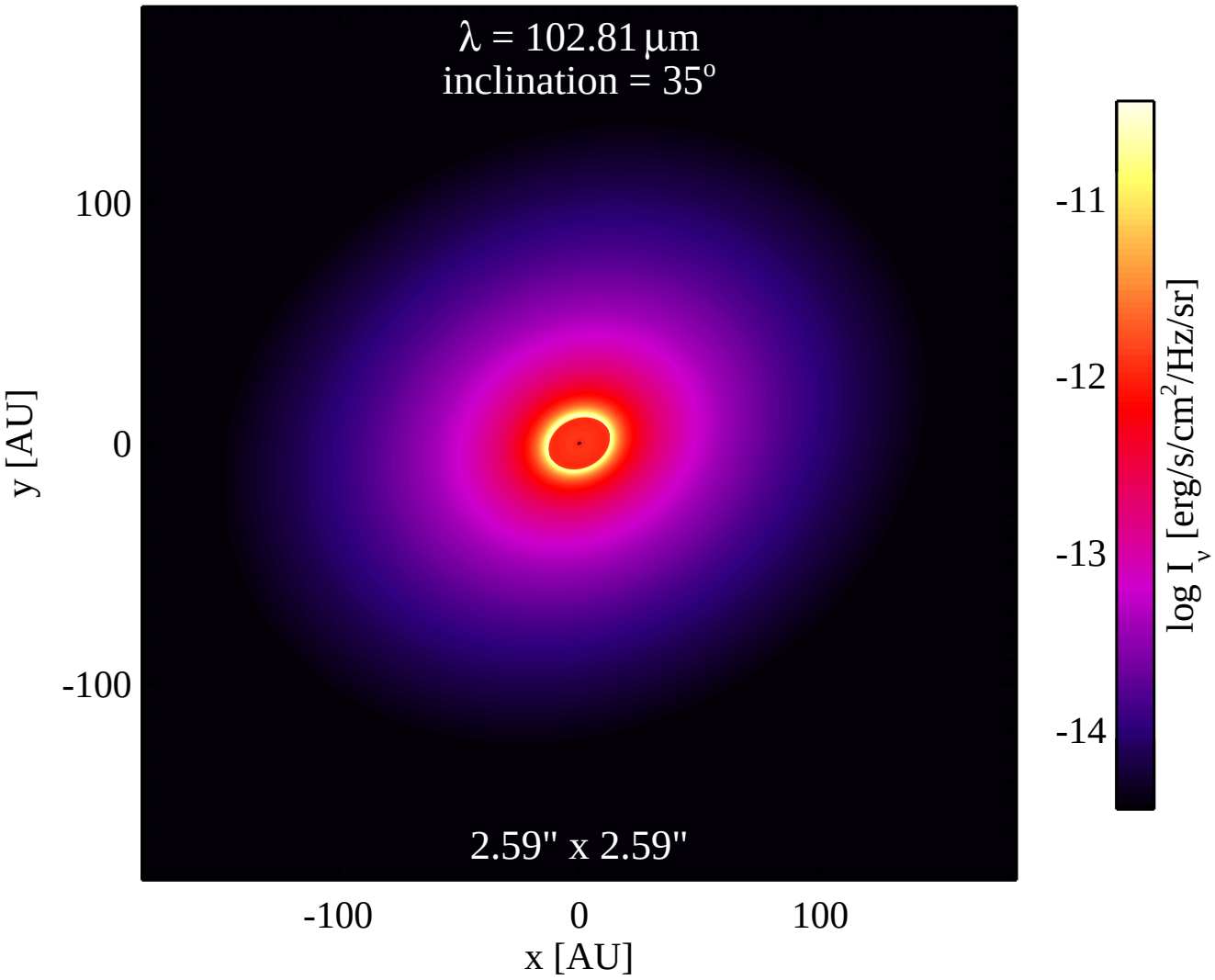

λ = 32.36 μm
inclination = 35°
0.76" x 0.76"
40
20
0
-20
-40
y [AU]
-40
-20
0
20
40
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

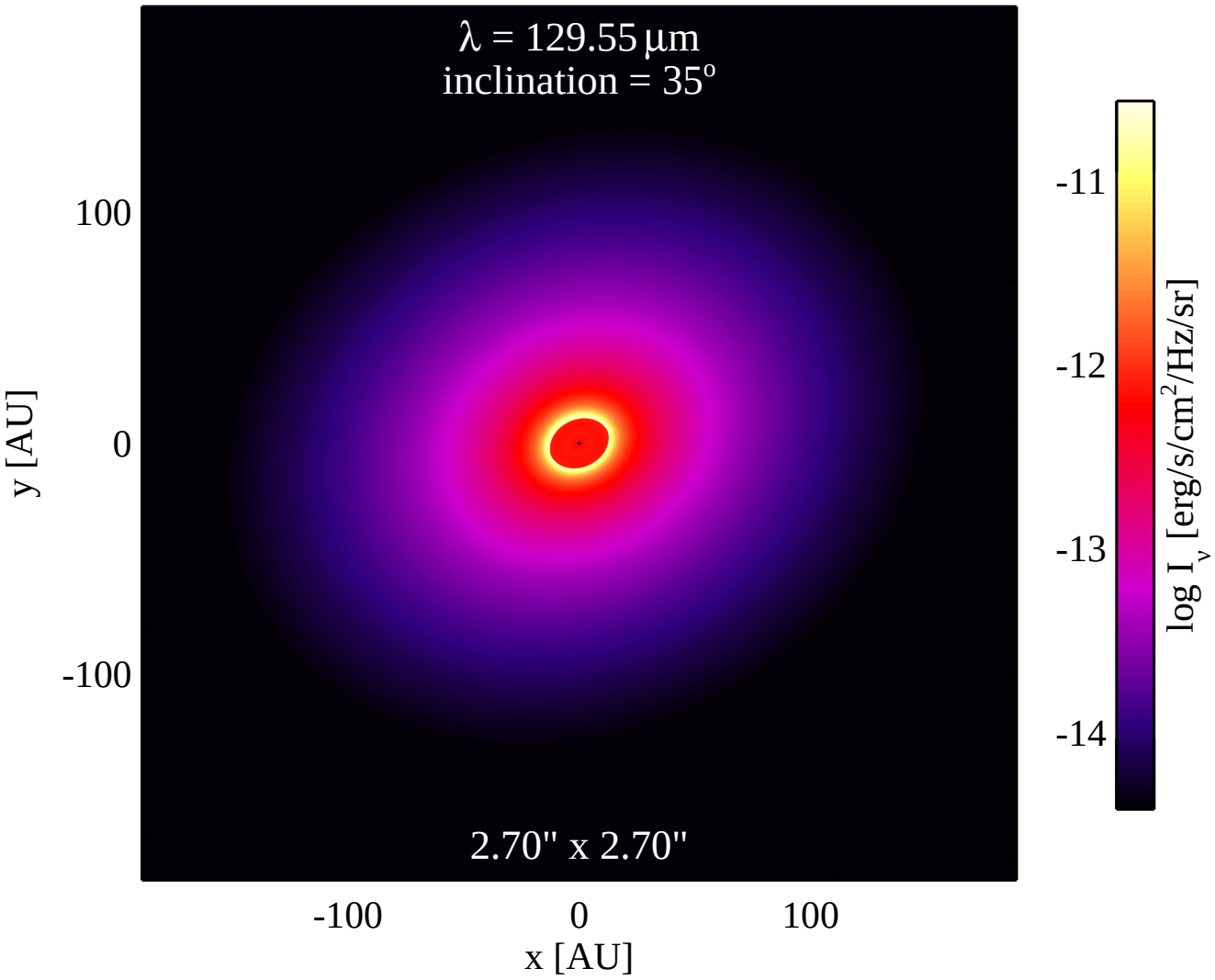

λ = 40.78 μm
inclination = 35°
1.18" x 1.18"
50
0
-50
y [AU]
-50
0
50
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

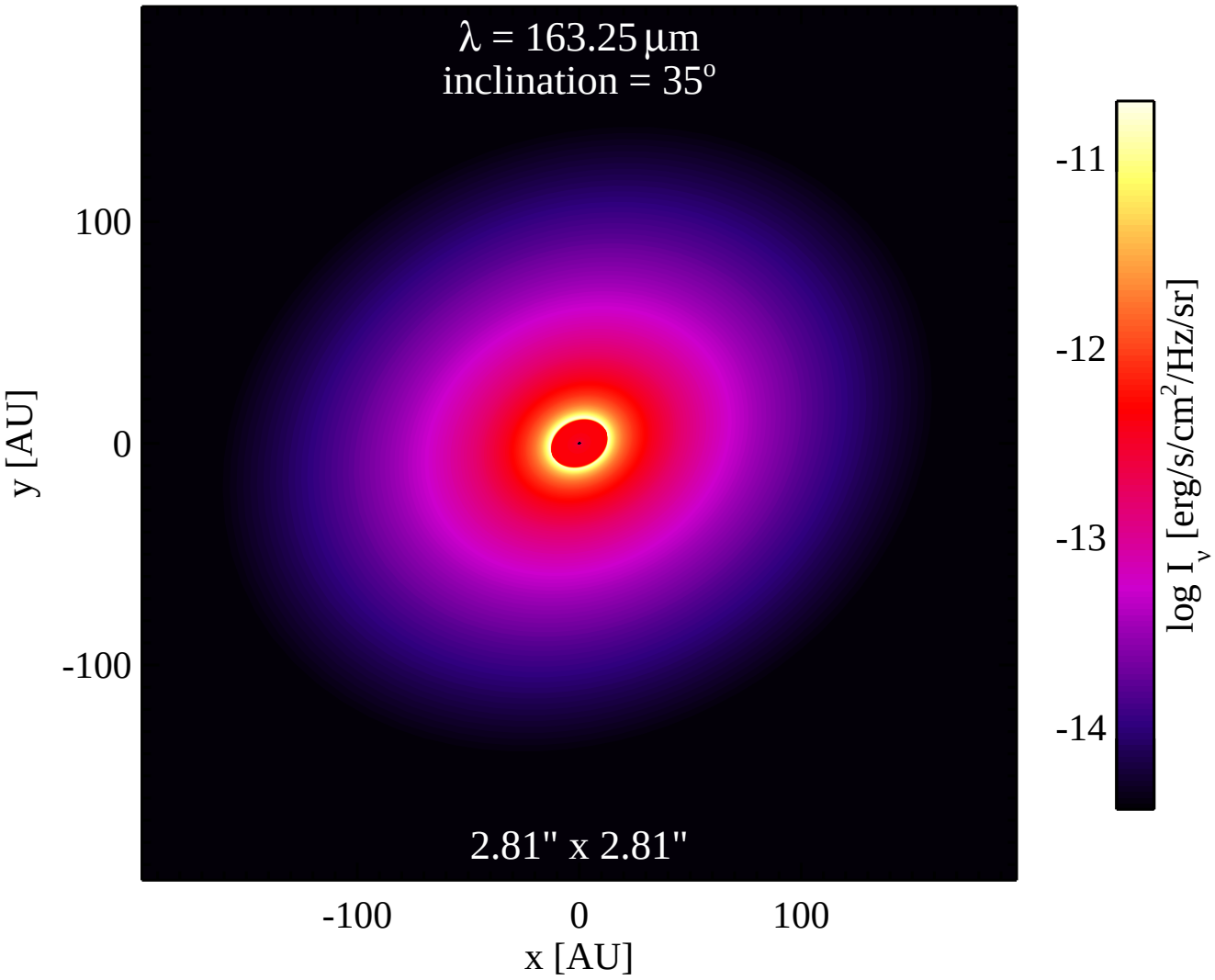

λ = 51.39 μm
inclination = 35°
1.69" x 1.69"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

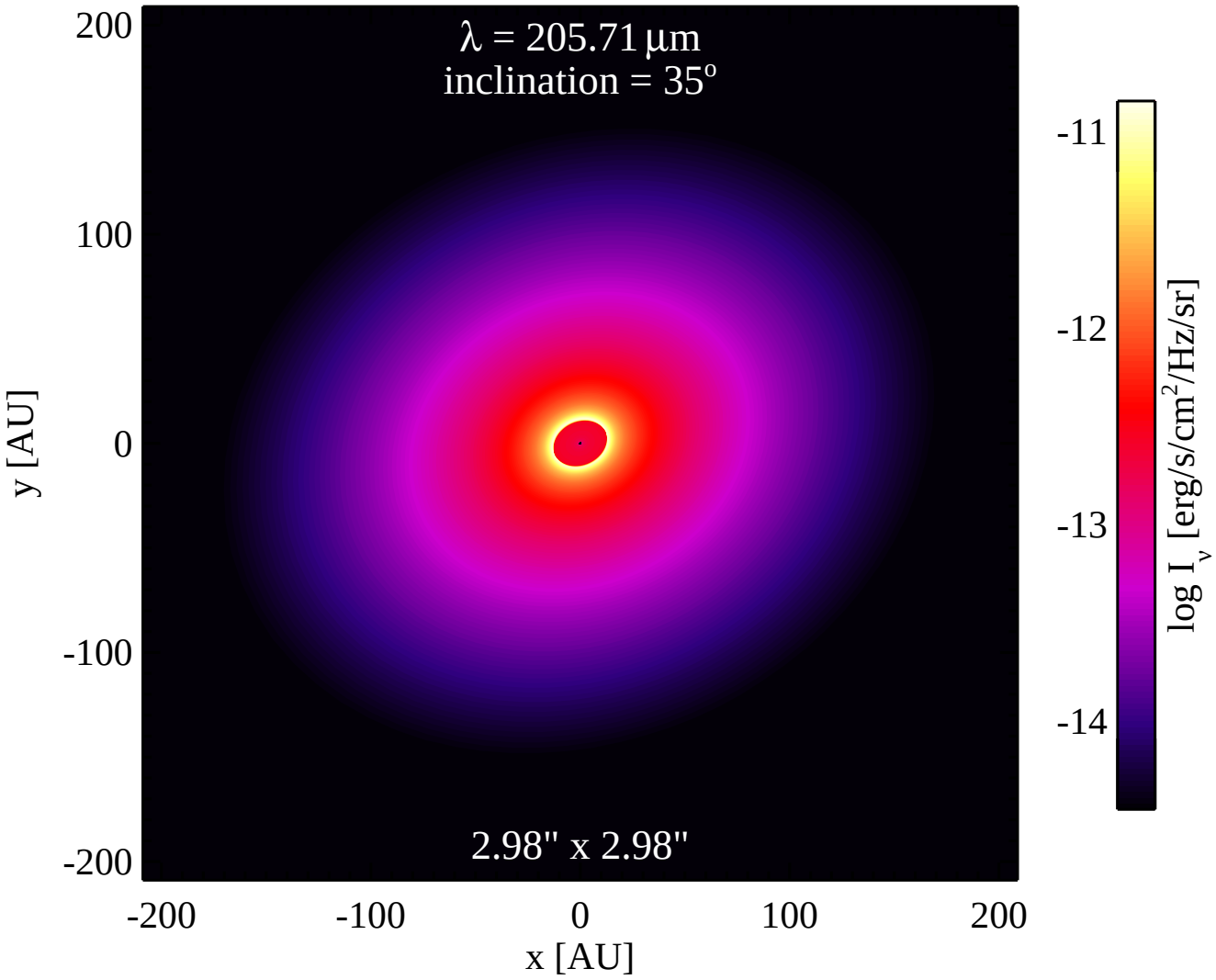

λ = 64.75 μm
inclination = 35°
2.13" x 2.13"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

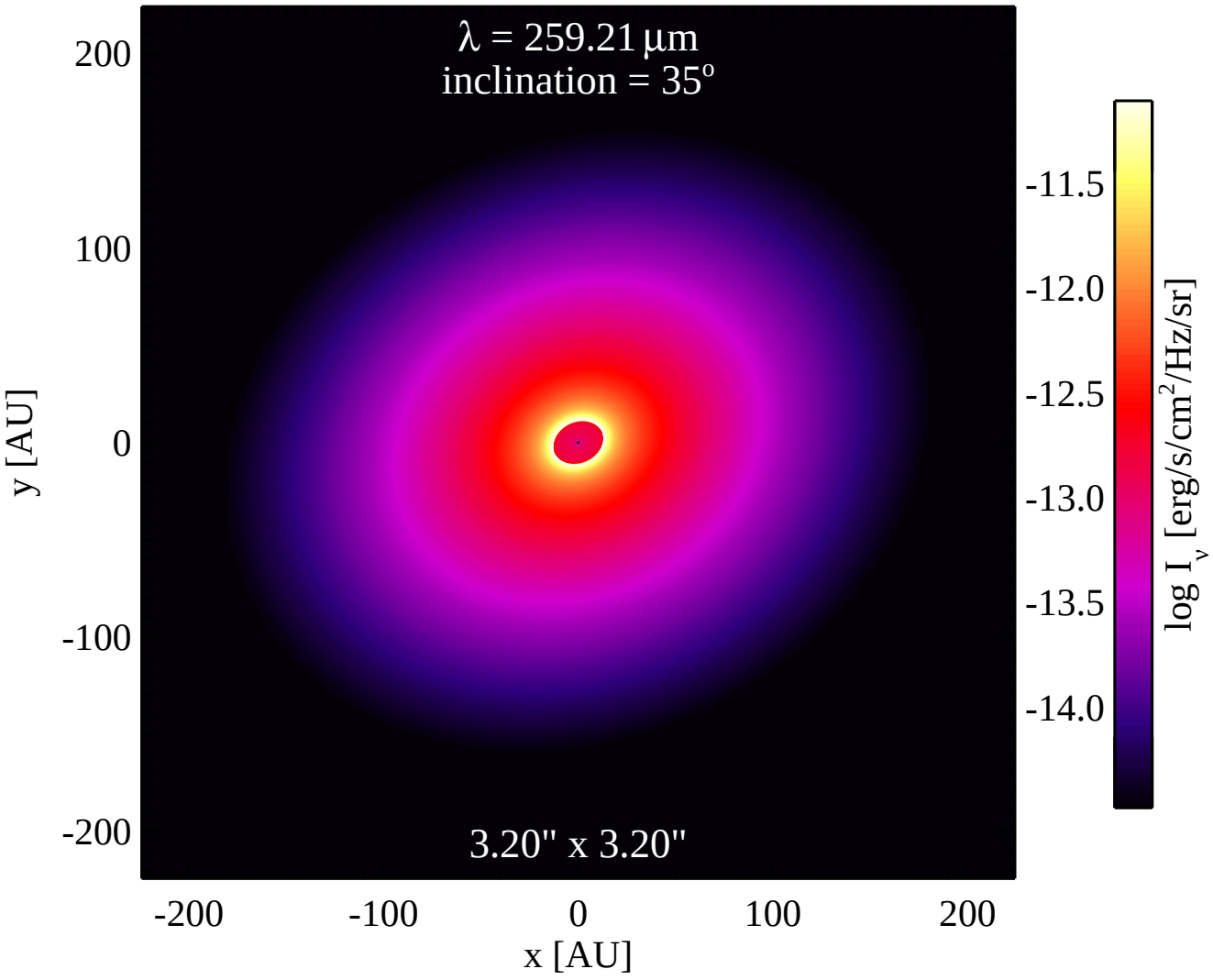

λ = 81.59 μm
inclination = 35°
2.42" x 2.42"
150
100
50
0
-50
-100
-150
y [AU]
-150
-100
-50
0
50
100
150
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

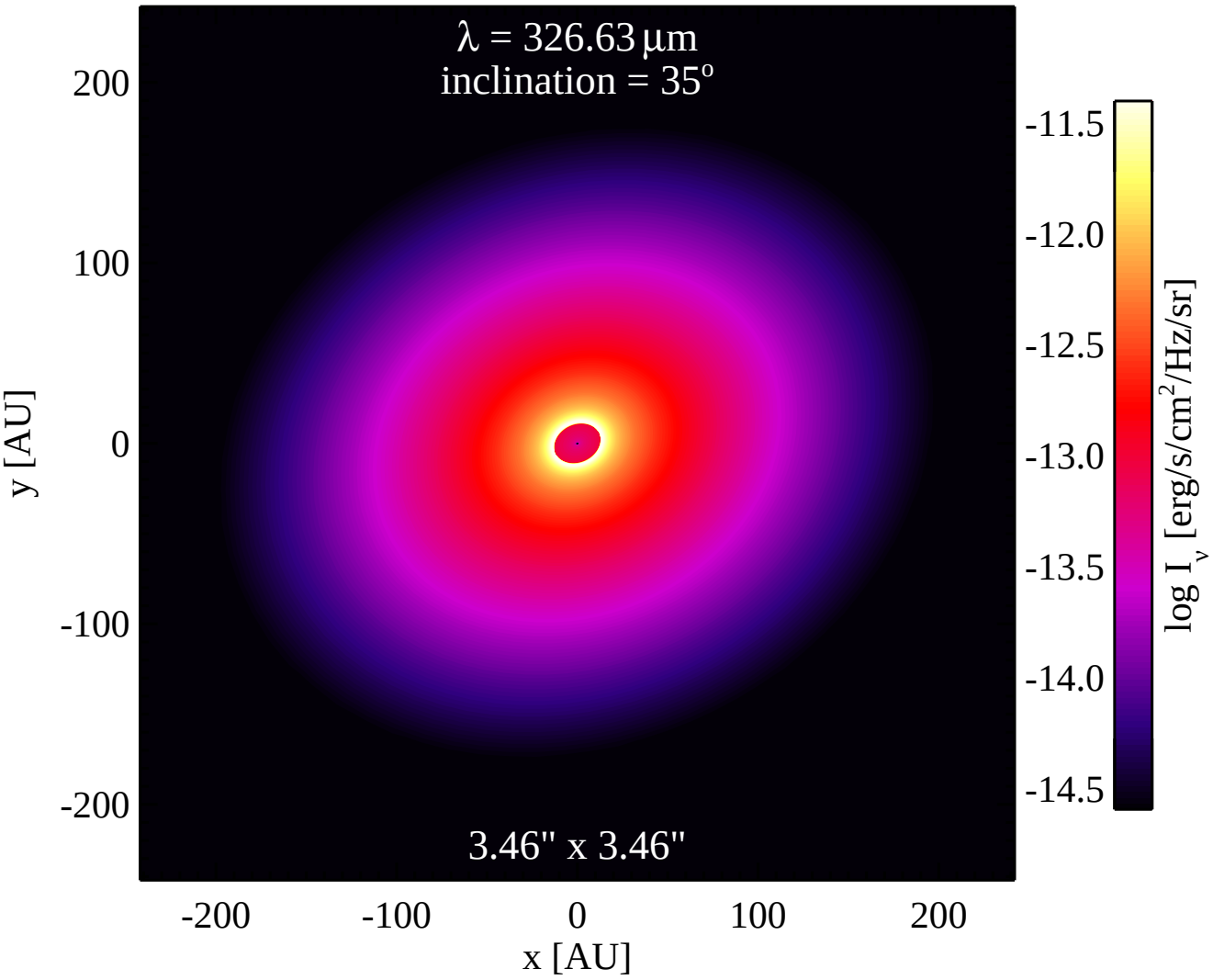

λ = 102.81 μm
inclination = 35°
2.59" x 2.59"
100
0
-100
y [AU]
-100
0
100
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

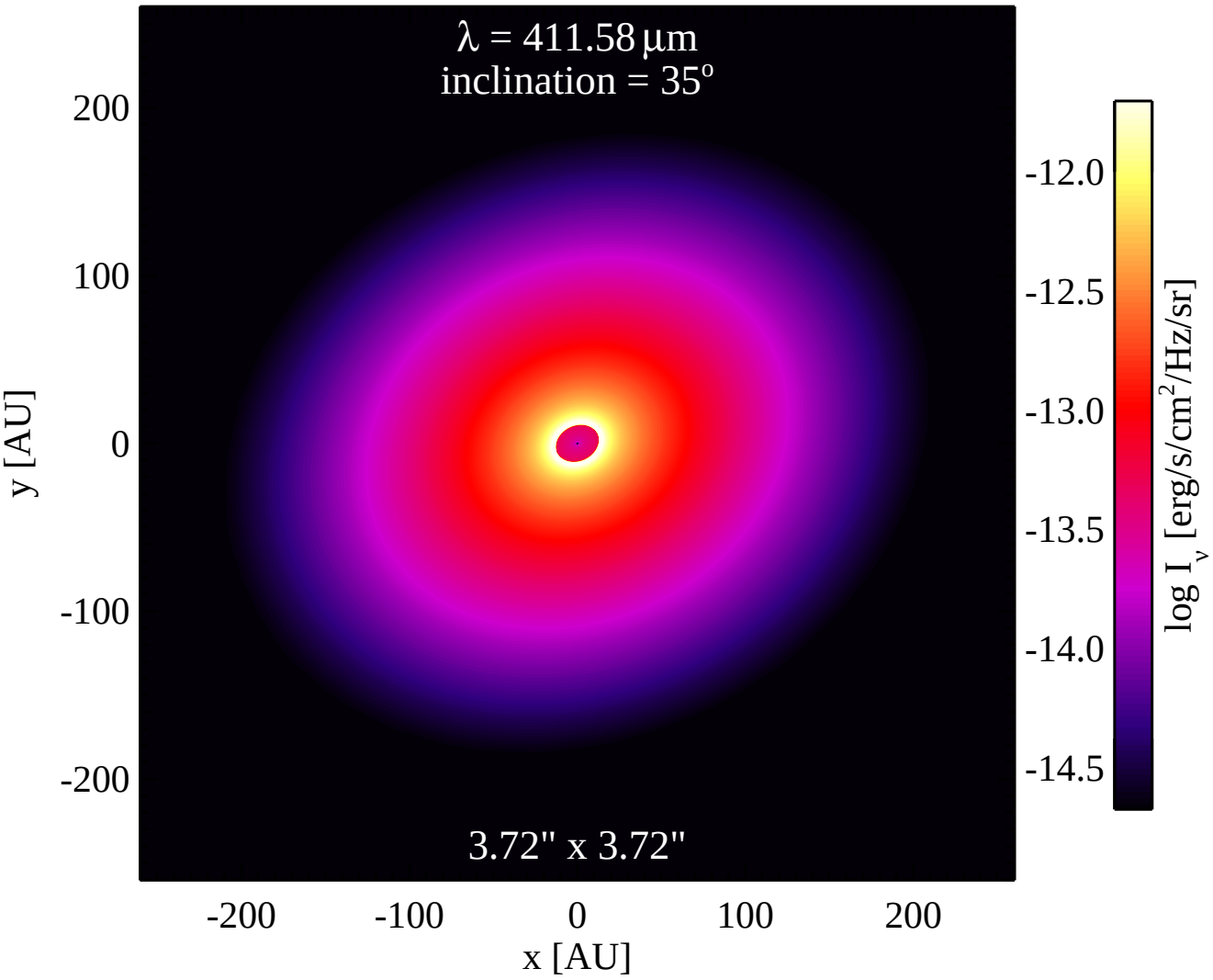

λ = 129.55 μm
inclination = 35°
2.70" x 2.70"
100
0
-100
y [AU]
-100
0
100
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

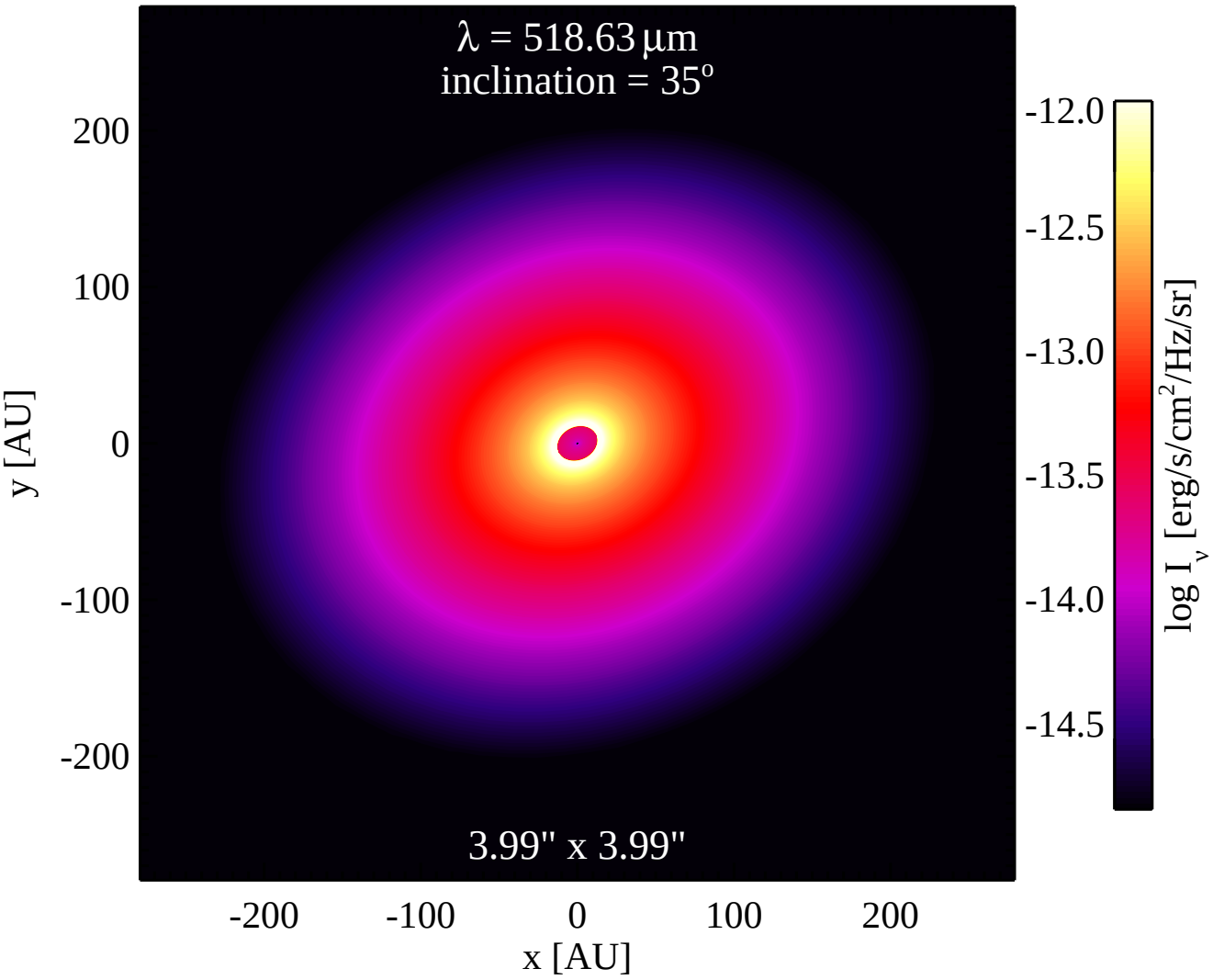

λ = 163.25 μm
inclination = 35°
2.81" x 2.81"
100
0
-100
y [AU]
-100
0
100
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

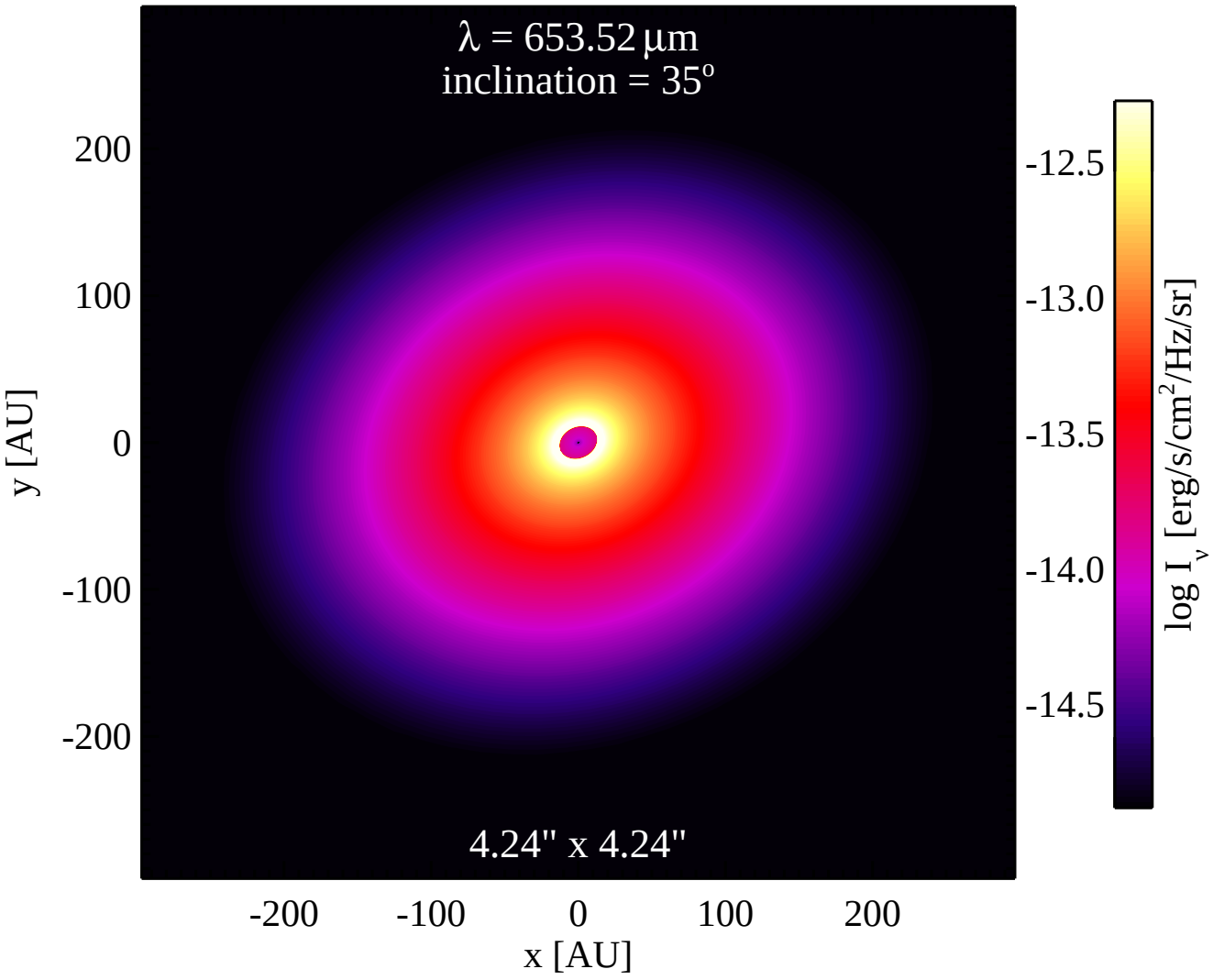

λ = 205.71 μm
inclination = 35°
2.98" x 2.98"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-11
-12
-13
-14
log I_ν [erg/s/cm²/Hz/sr]

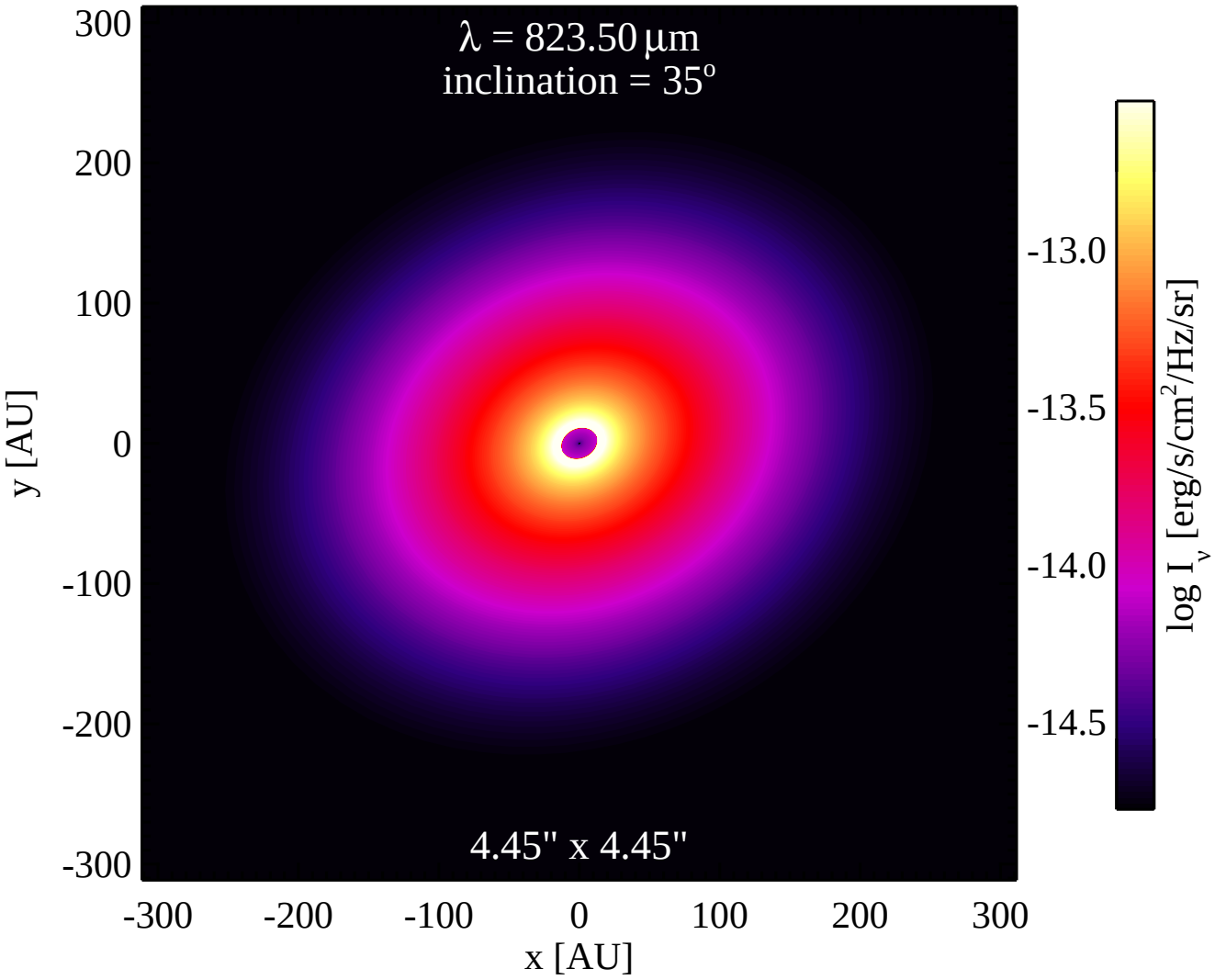

λ = 259.21 μm
inclination = 35°
3.20" x 3.20"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
-14.0
log I_ν [erg/s/cm²/Hz/sr]

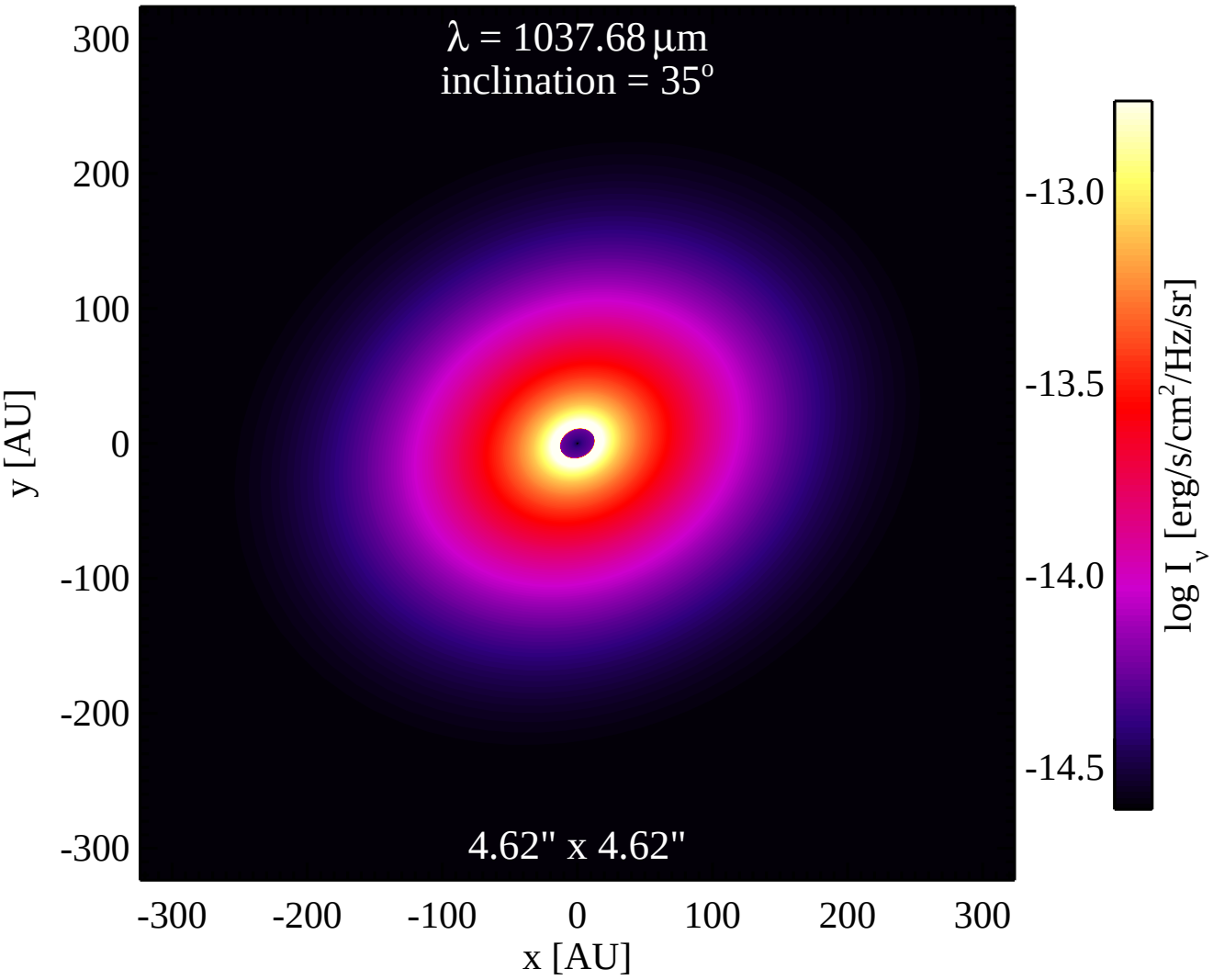

λ = 326.63 μm
inclination = 35°
3.46" x 3.46"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

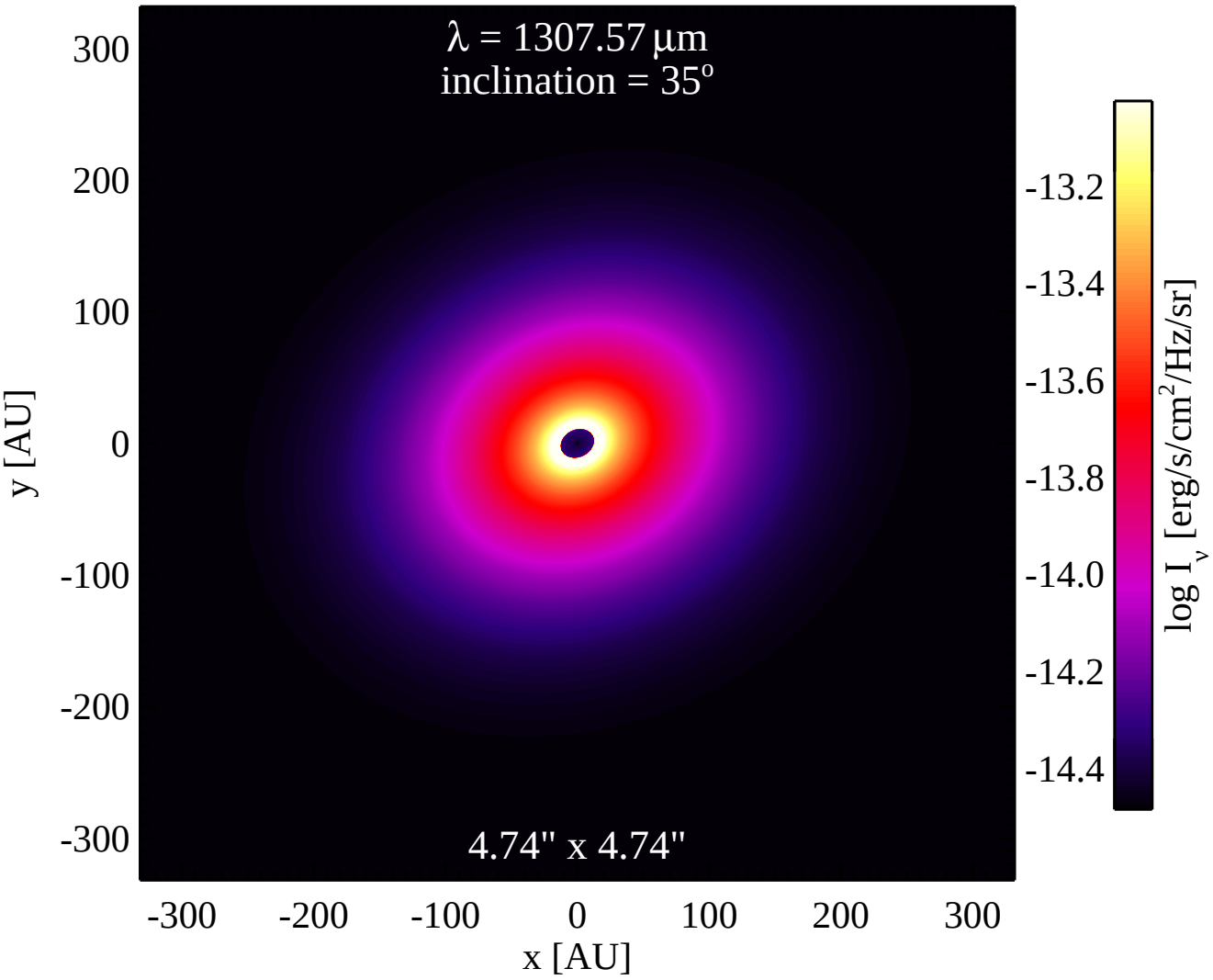

λ = 411.58 μm
inclination = 35°
3.72" x 3.72"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-12.0
-12.5
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

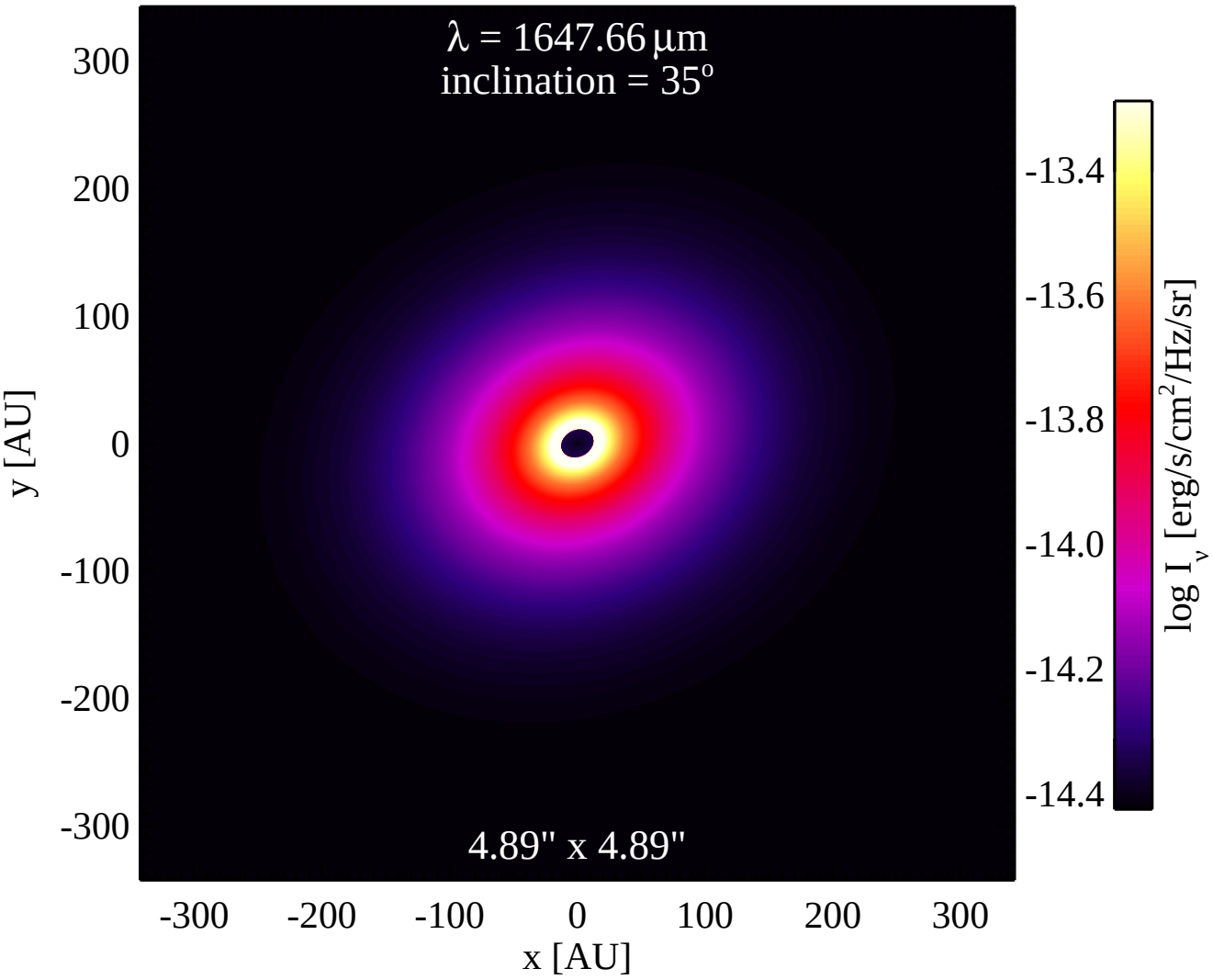

λ = 518.63 μm
inclination = 35°
3.99" x 3.99"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-12.0
-12.5
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

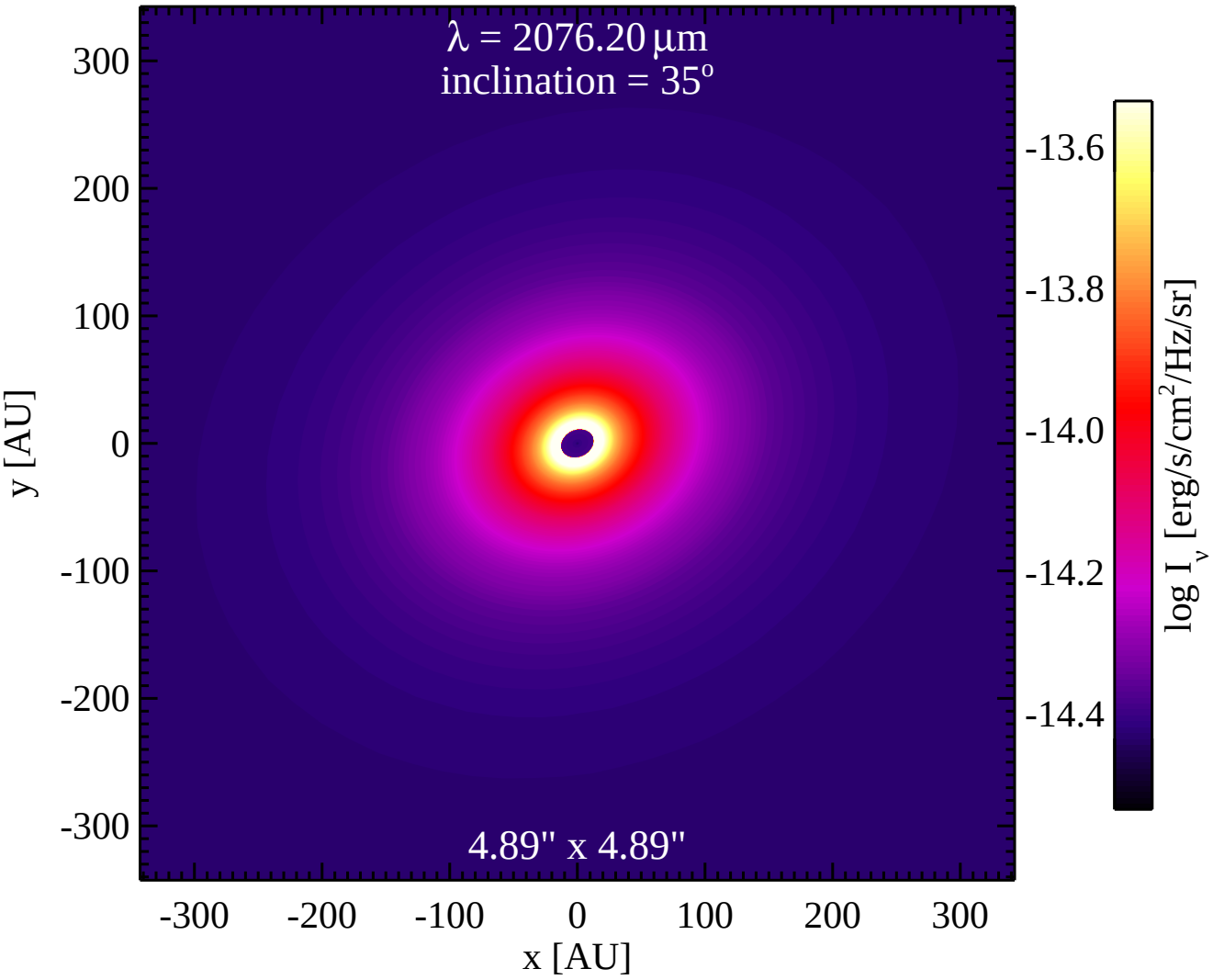

λ = 653.52 μm
inclination = 35°
4.24" x 4.24"
200
100
0
-100
-200
y [AU]
-200
-100
0
100
200
x [AU]
-12.5
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

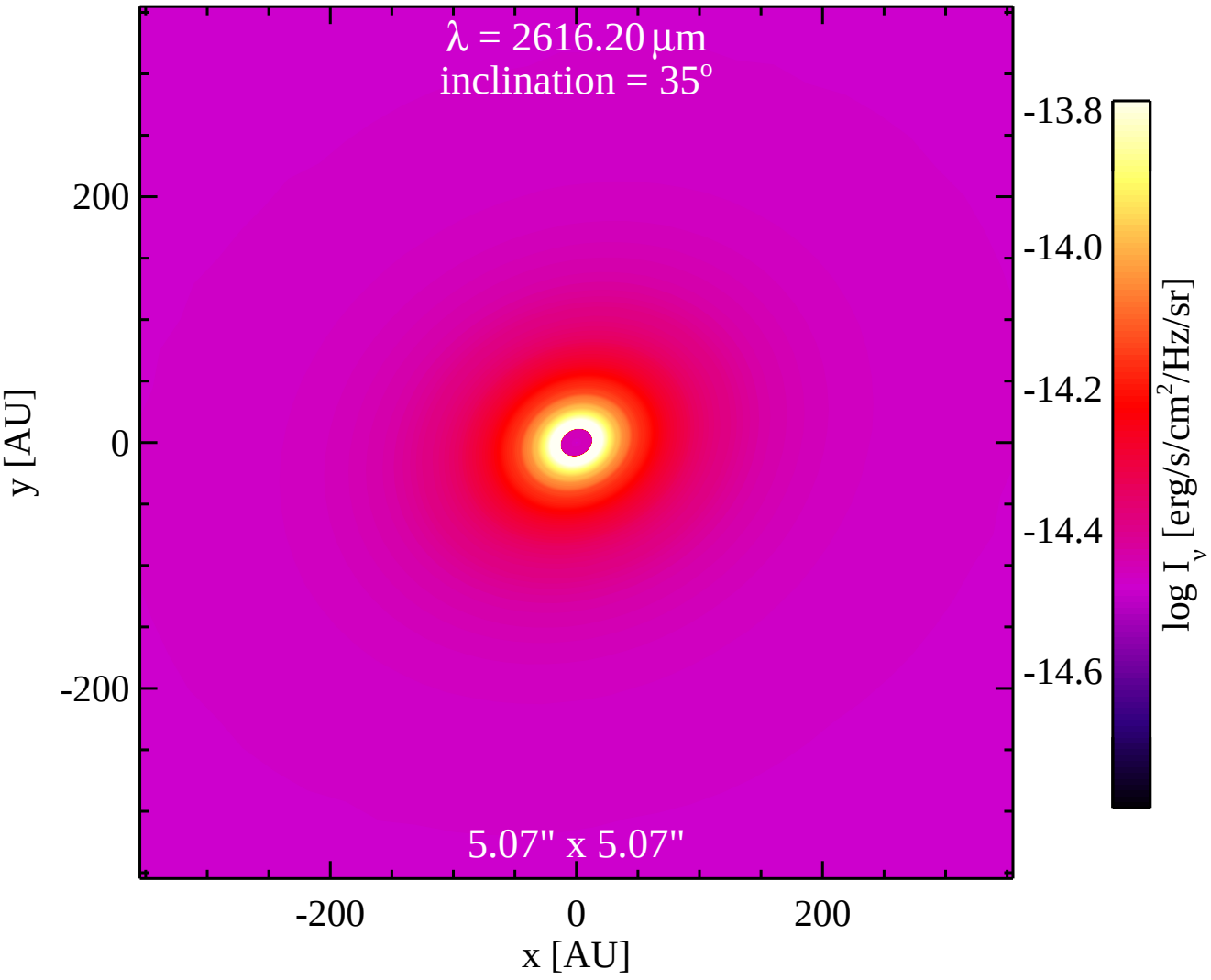

λ = 823.50 μm
inclination = 35°
4.45" x 4.45"
300
200
100
0
-100
-200
-300
y [AU]
-300
-200
-100
0
100
200
300
x [AU]
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

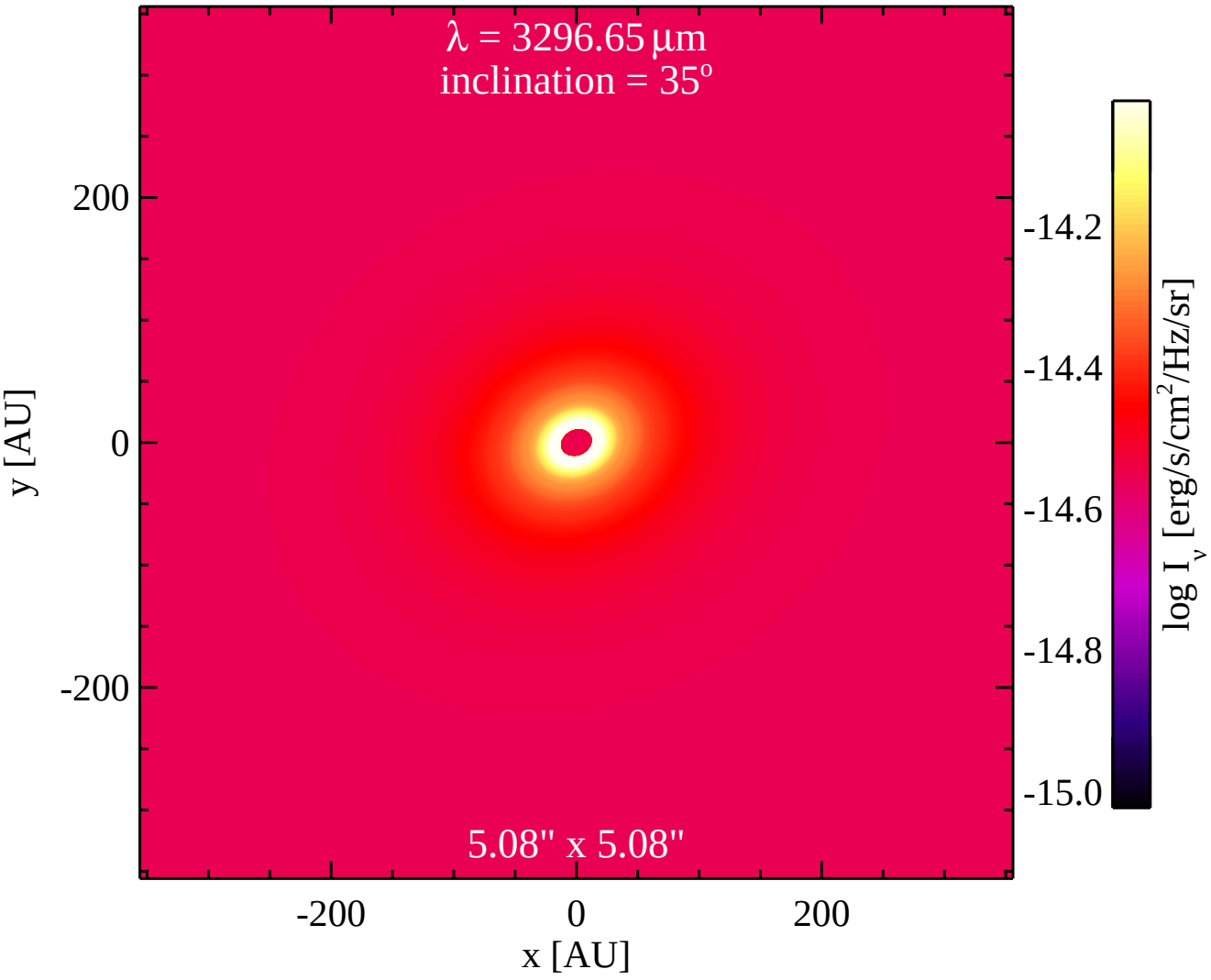

λ = 1037.68 μm
inclination = 35°
4.62" x 4.62"
300
200
100
0
-100
-200
-300
y [AU]
-300
-200
-100
0
100
200
300
x [AU]
-13.0
-13.5
-14.0
-14.5
log I_ν [erg/s/cm²/Hz/sr]

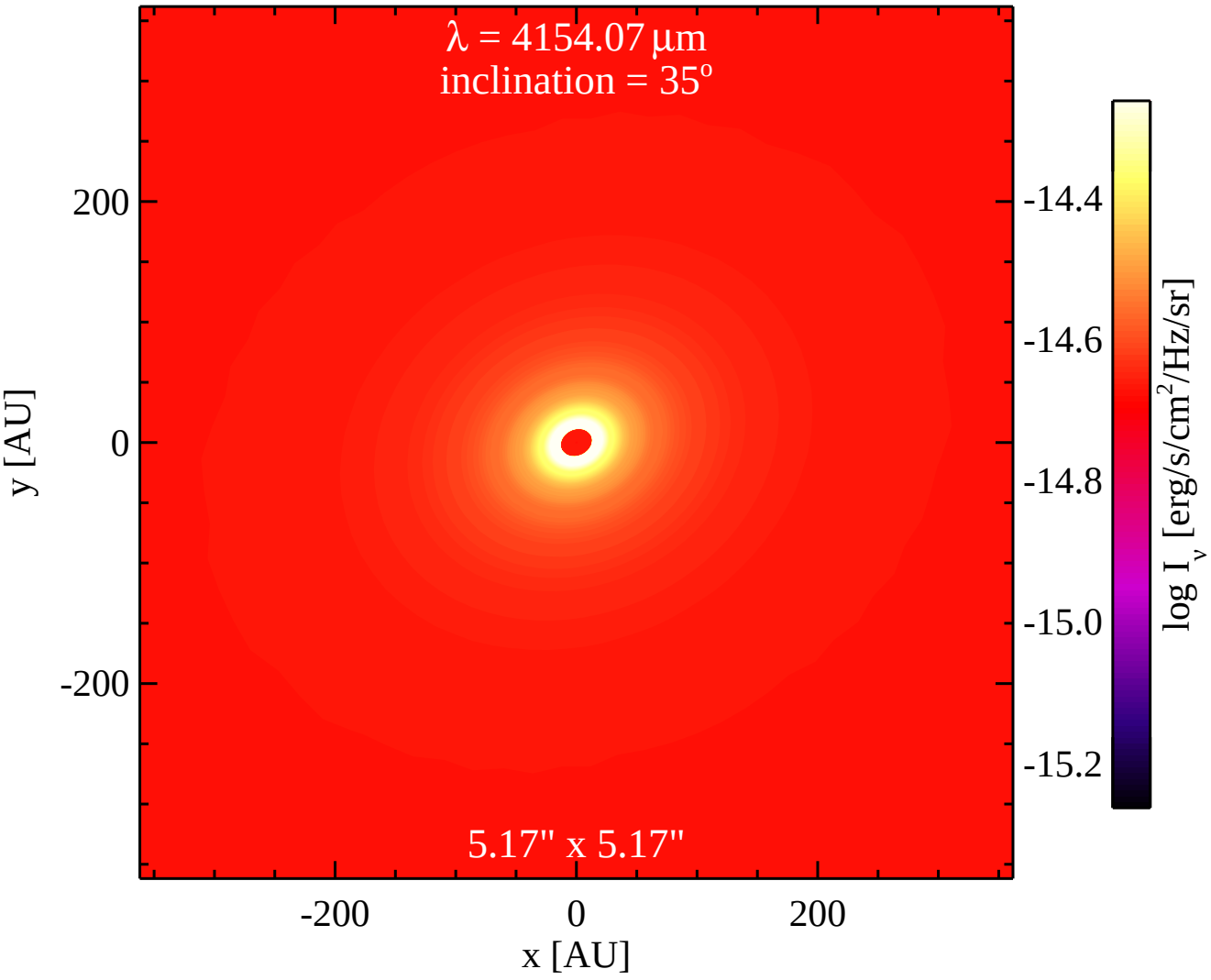

λ = 1307.57 μm
inclination = 35°
4.74" x 4.74"
300
200
100
0
-100
-200
-300
y [AU]
-300
-200
-100
0
100
200
300
x [AU]
-13.2
-13.4
-13.6
-13.8
-14.0
-14.2
-14.4
log I_ν [erg/s/cm²/Hz/sr]

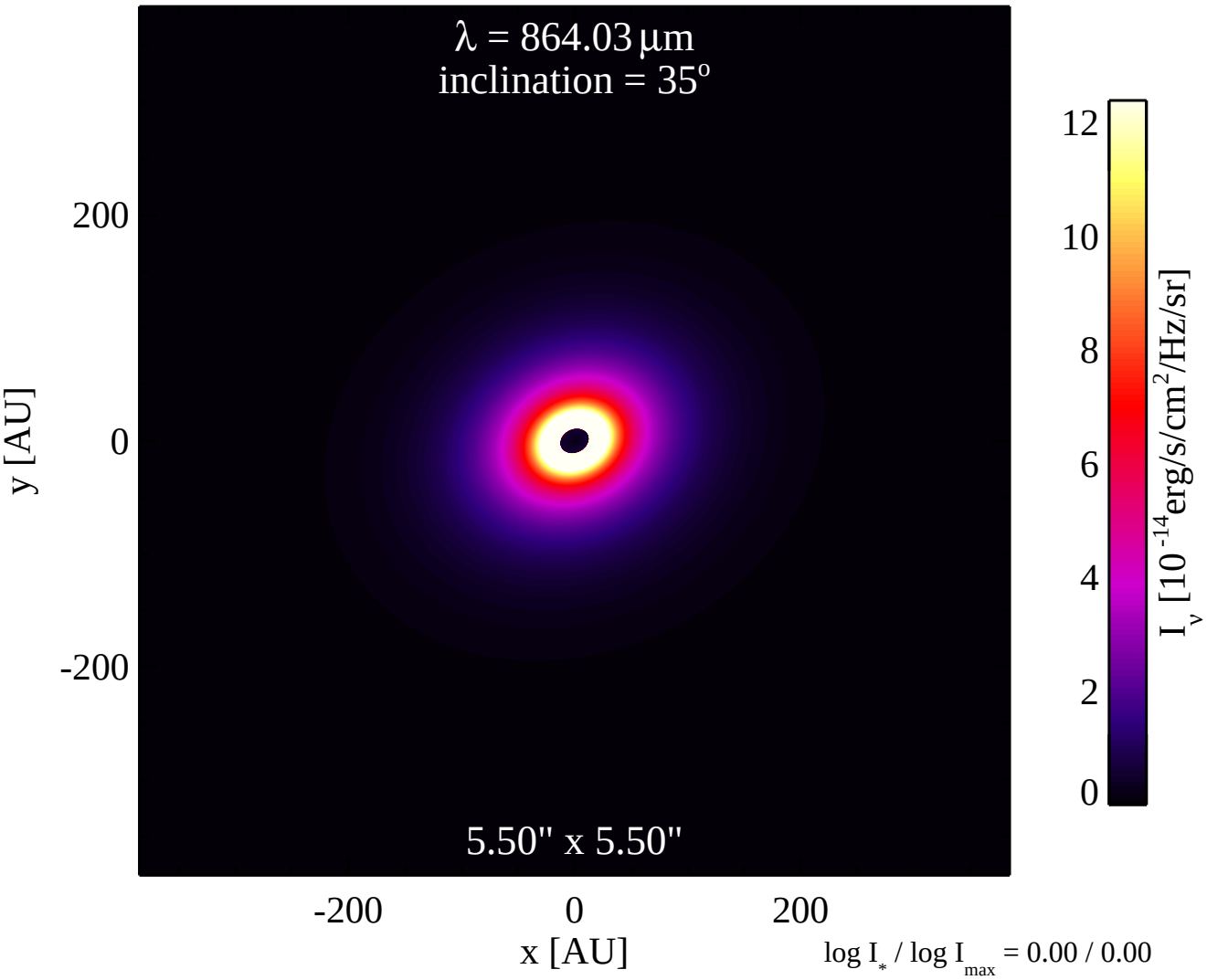

λ = 1647.66 μm
inclination = 35°
4.89" x 4.89"
300
200
100
0
-100
-200
-300
y [AU]
-300
-200
-100
0
100
200
300
x [AU]
-13.4
-13.6
-13.8
-14.0
-14.2
-14.4
log I_ν [erg/s/cm²/Hz/sr]

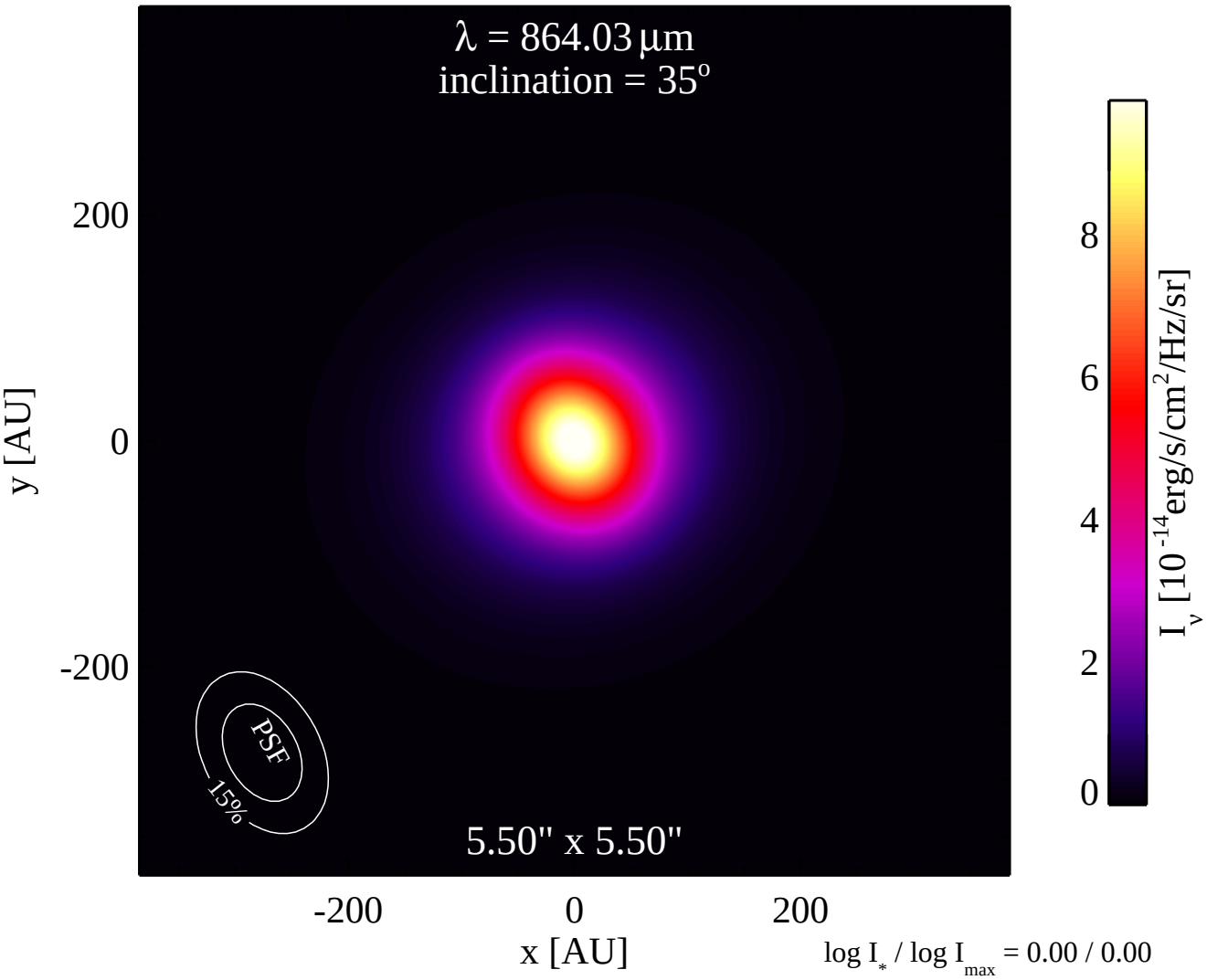

λ = 2076.20 μm
inclination = 35°
4.89" x 4.89"
300
200
100
0
-100
-200
-300
y [AU]
-300
-200
-100
0
100
200
300
x [AU]
-13.6
-13.8
-14.0
-14.2
-14.4
log I_ν [erg/s/cm²/Hz/sr]

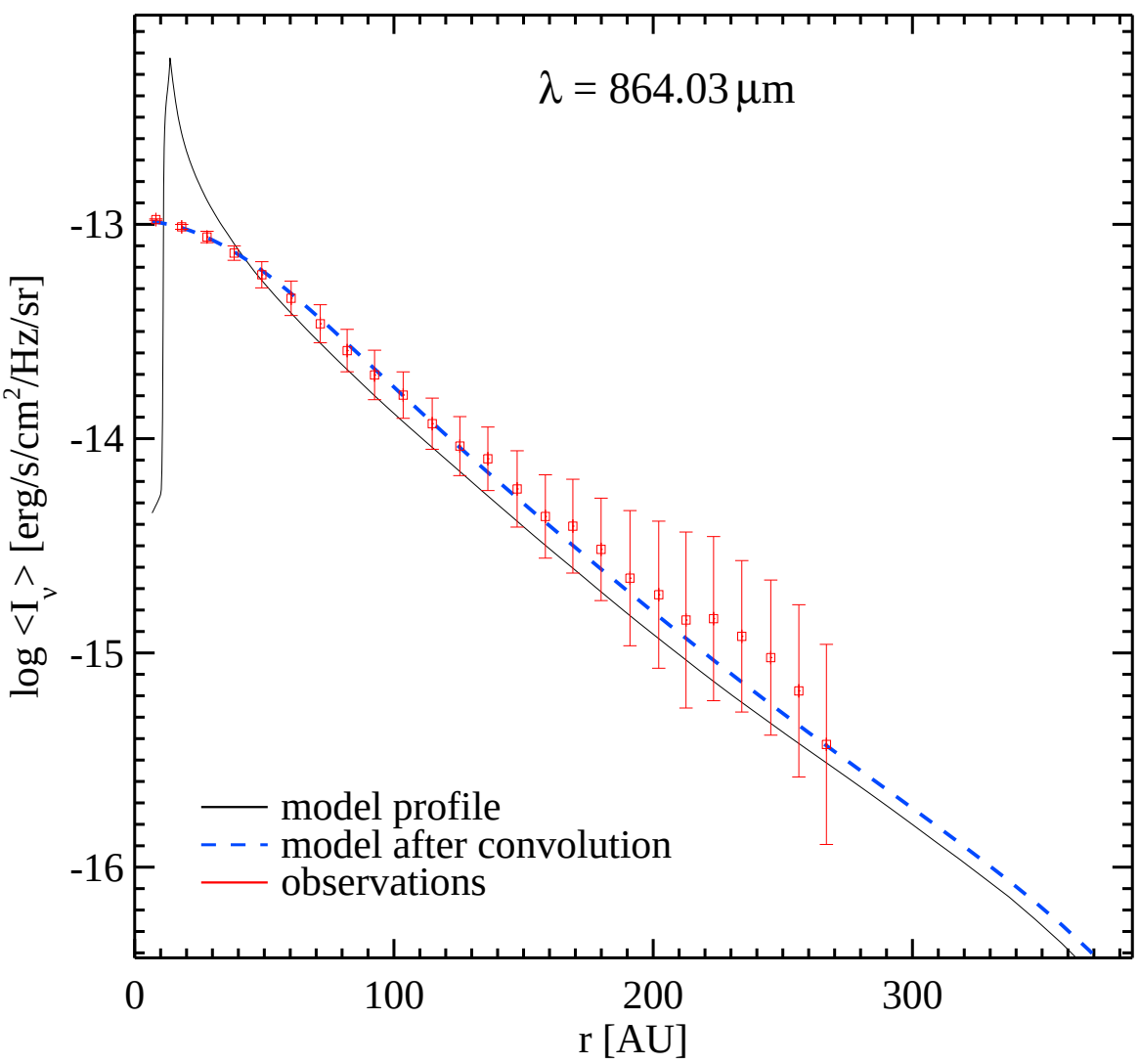

λ = 2616.20 μm
inclination = 35°
5.07" x 5.07"
200
0
-200
y [AU]
-200
0
200
x [AU]
-13.8
-14.0
-14.2
-14.4
-14.6
log I_ν [erg/s/cm²/Hz/sr]

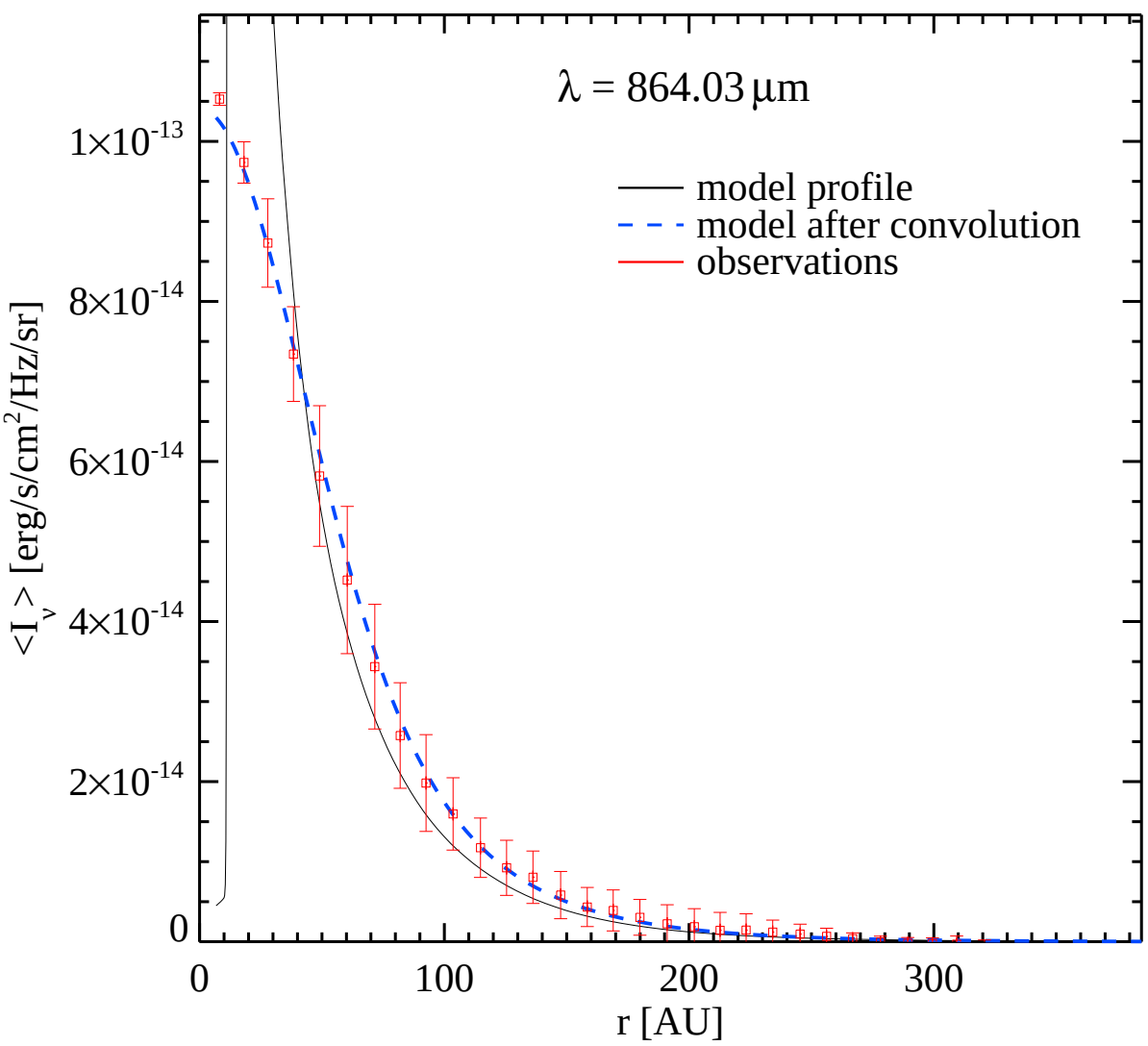

λ = 3296.65 μm
inclination = 35°
5.08" x 5.08"
200
0
-200
y [AU]
-200
0
200
x [AU]
-14.2
-14.4
-14.6
-14.8
-15.0
log I_ν [erg/s/cm²/Hz/sr]

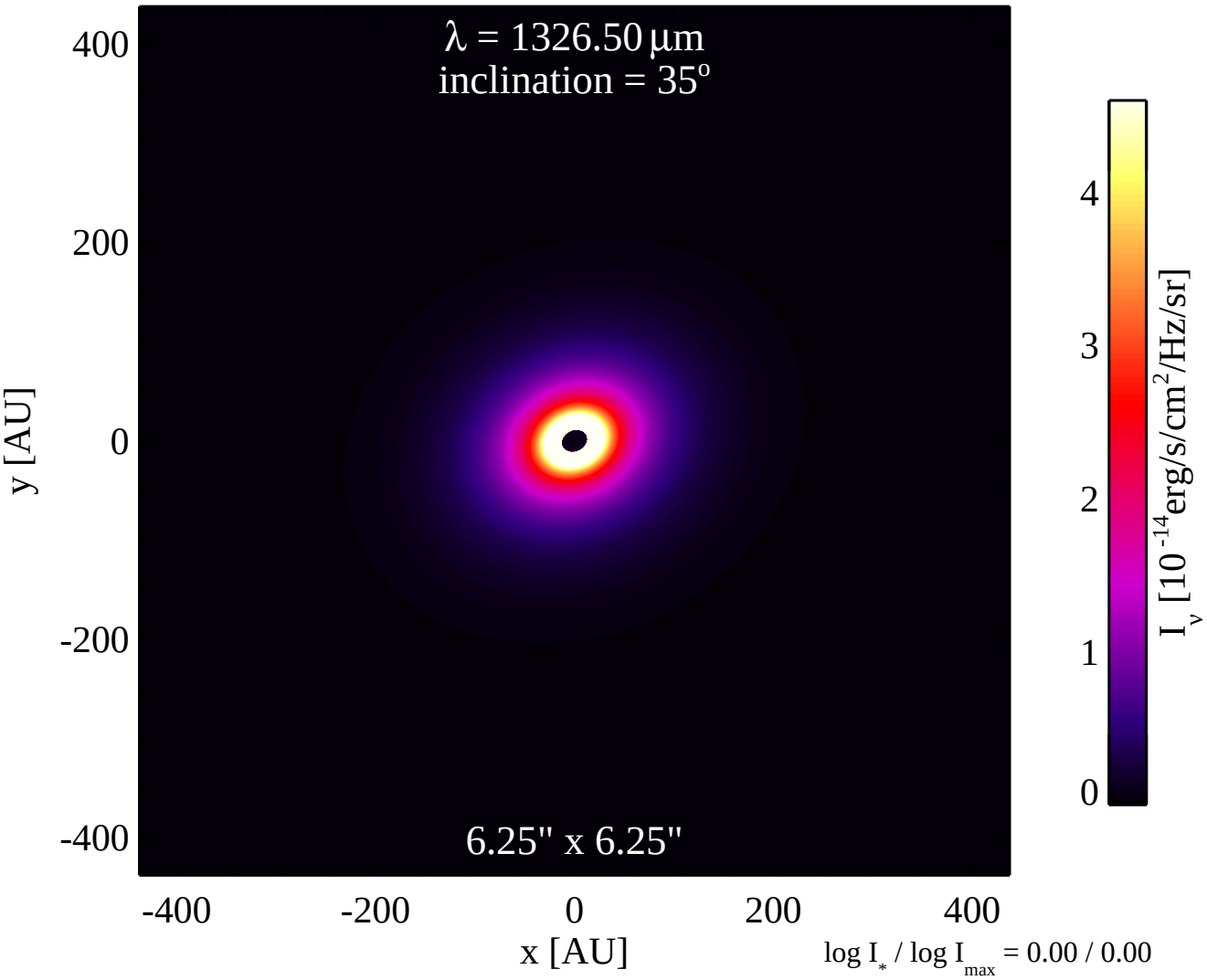

λ = 4154.07 μm
inclination = 35°
5.17" x 5.17"
200
0
-200
y [AU]
-200
0
200
x [AU]
-14.4
-14.6
-14.8
-15.0
-15.2
log I_ν [erg/s/cm²/Hz/sr]

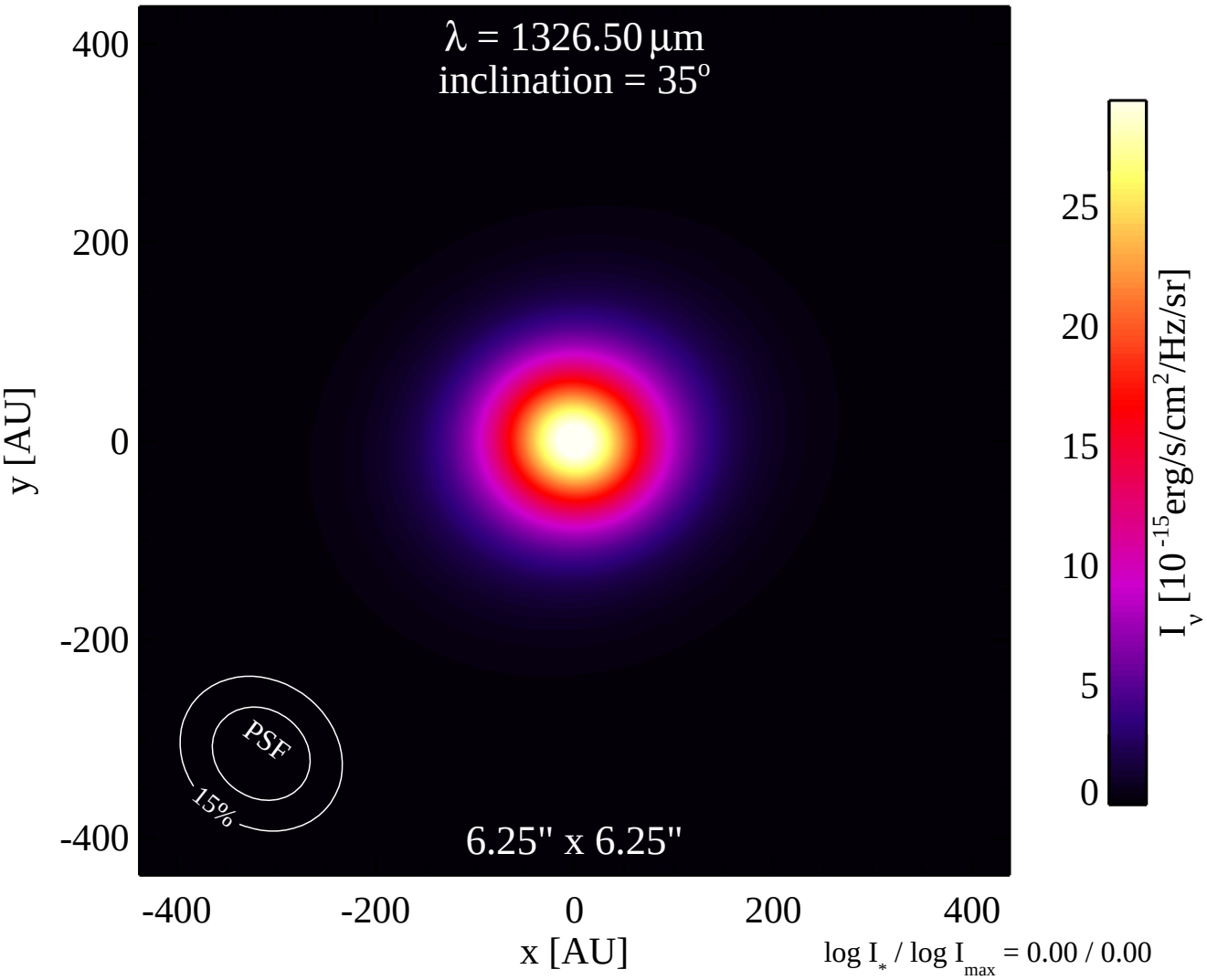

λ = 864.03 μm
inclination = 35°
5.50" x 5.50"
200
0
-200
y [AU]
-200
0
200
x [AU]
12
10
8
6
4
2
0
I_ν [10^-14 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

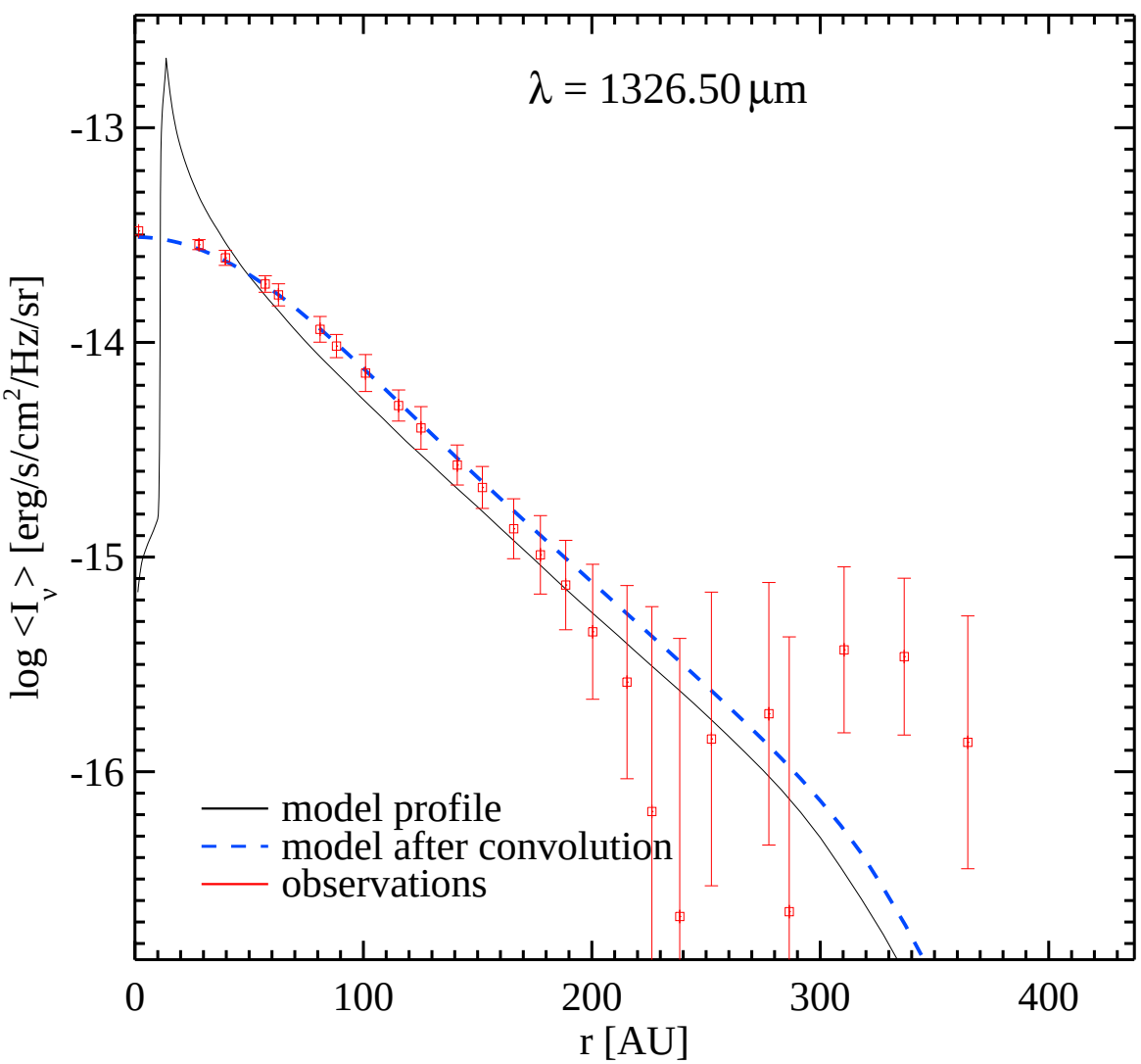

λ = 864.03 μm
inclination = 35°
200
0
-200
y [AU]
PSF
15%
5.50" x 5.50"
-200
0
200
x [AU]
8
6
4
2
0
I_ν [10^-14 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

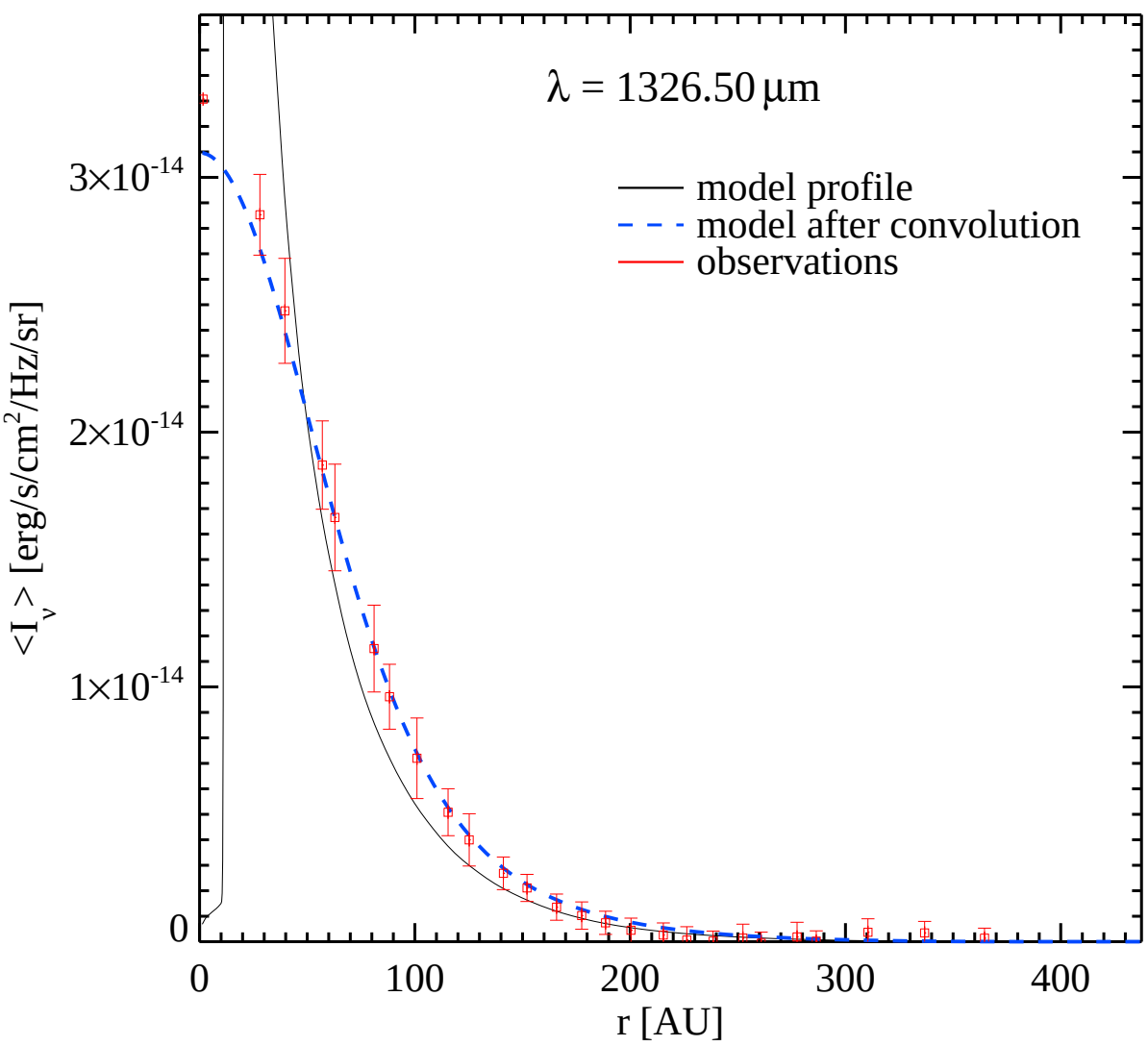

λ = 864.03 μm
log <I_ν> [erg/s/cm²/Hz/sr]
-13
-14
-15
-16
0
100
200
300
r [AU]
model profile
model after convolution
observations

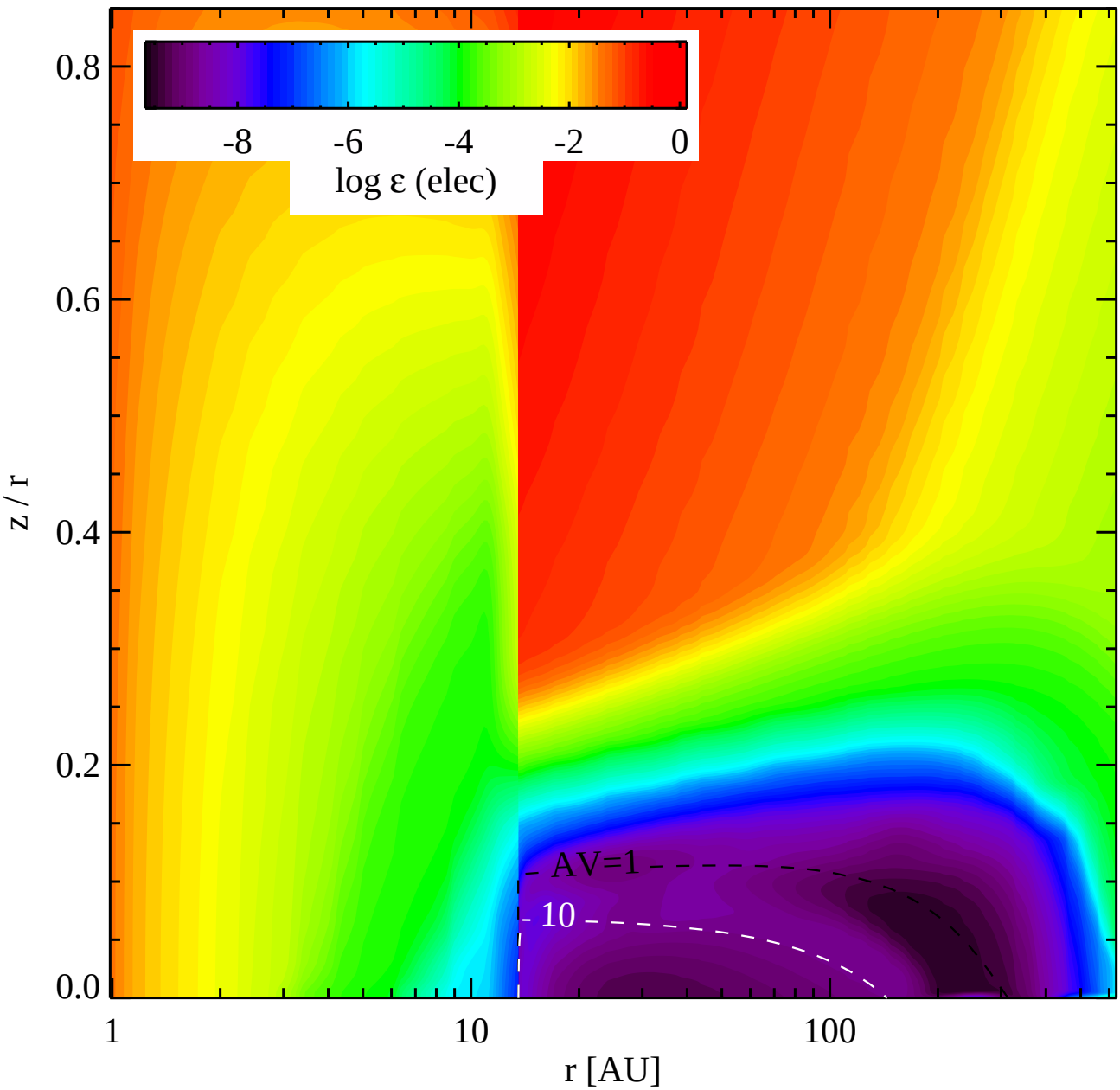

λ = 864.03 μm
model profile
model after convolution
observations
1×10-13
8×10-14
6×10-14
4×10-14
2×10-14
0
<I ν> [erg/s/cm2/Hz/sr]
0
100
200
300
r [AU]

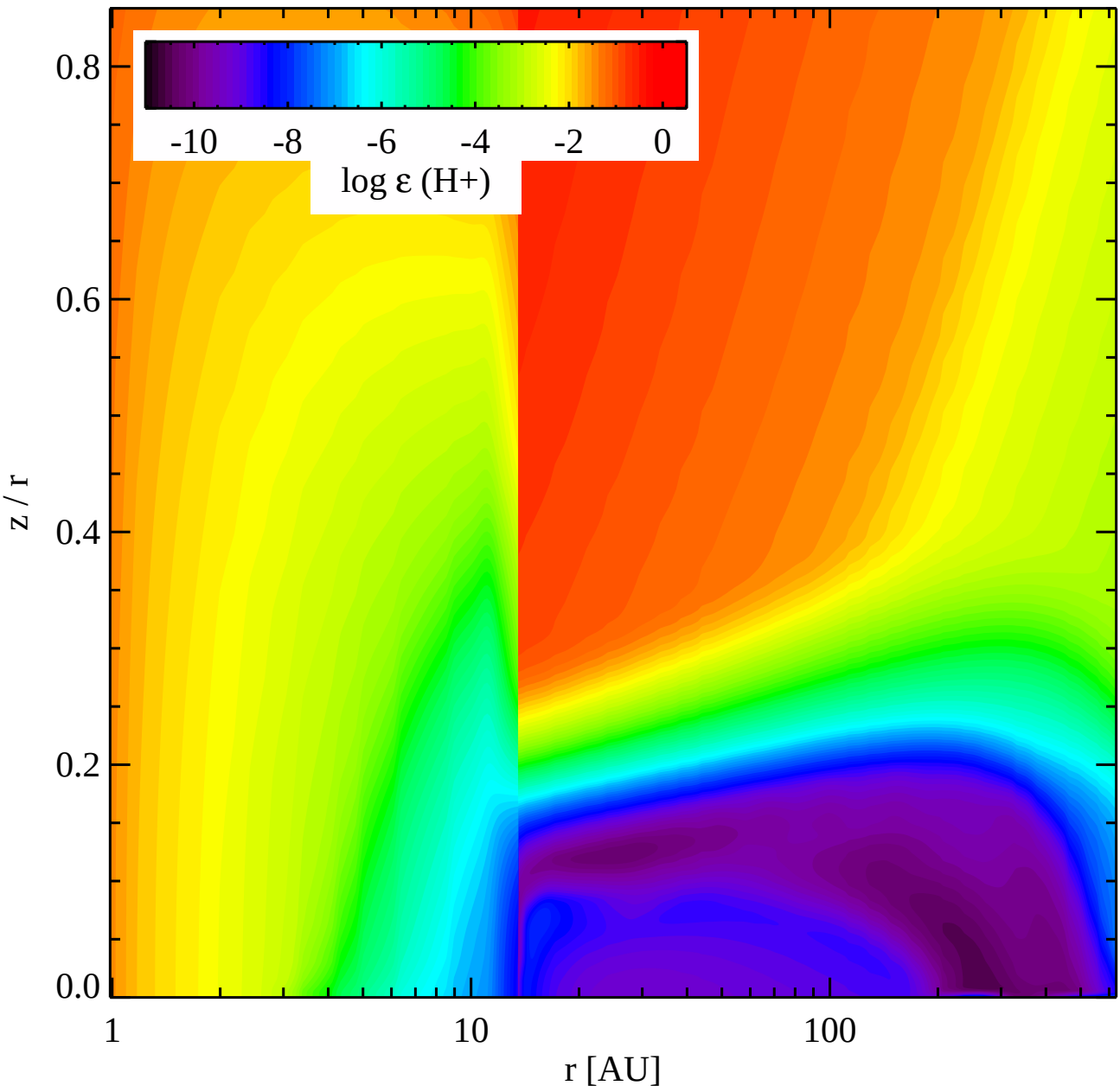

λ = 1326.50 μm
inclination = 35°
6.25" x 6.25"
400
200
0
-200
-400
y [AU]
-400
-200
0
200
400
x [AU]
4
3
2
1
0
I_ν [10^-14 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

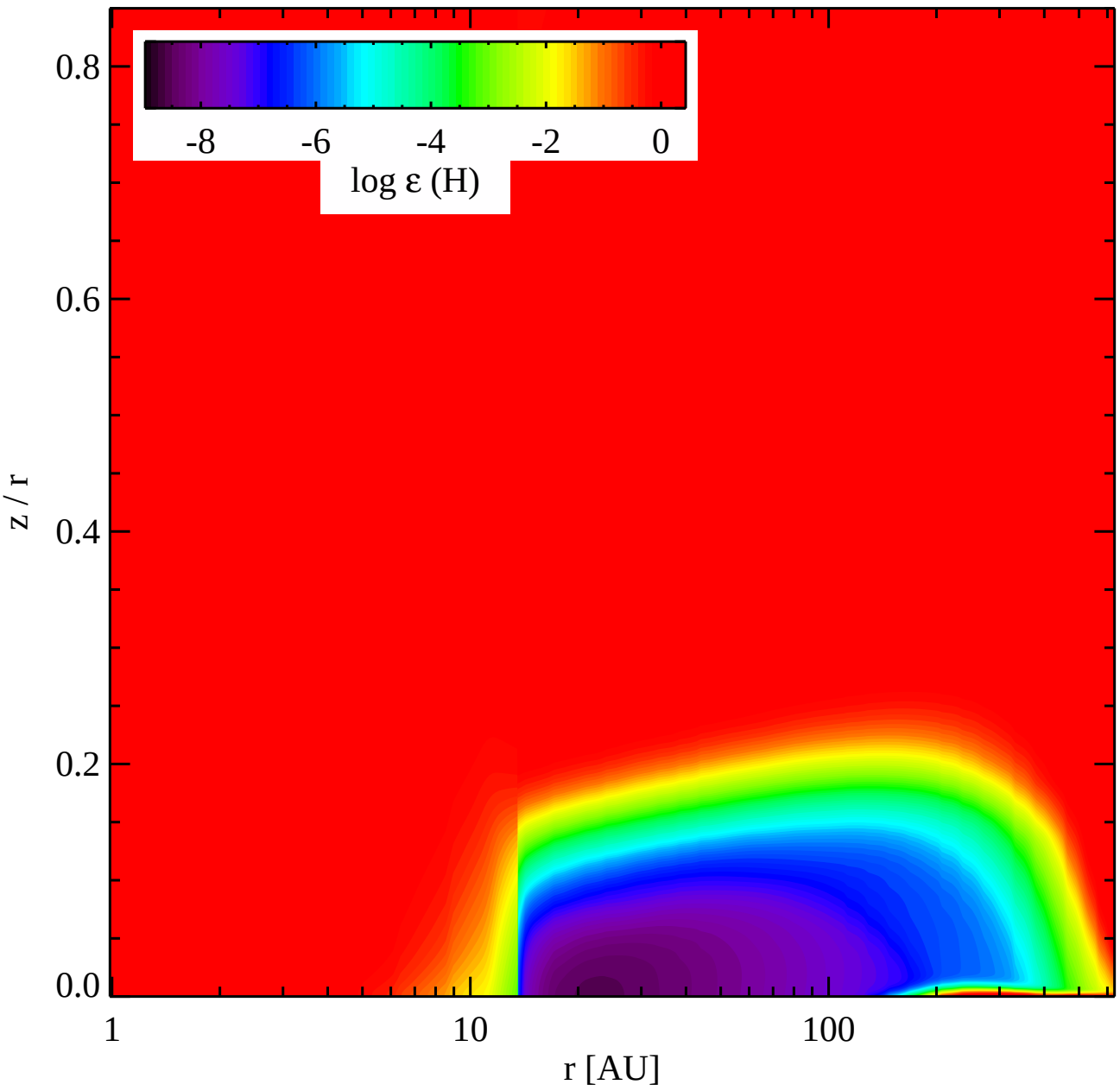

λ = 1326.50 μm
inclination = 35°
PSF
15%
6.25" x 6.25"
400
200
0
-200
-400
y [AU]
-400
-200
0
200
400
x [AU]
25
20
15
10
5
0
I_ν [10^-15 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

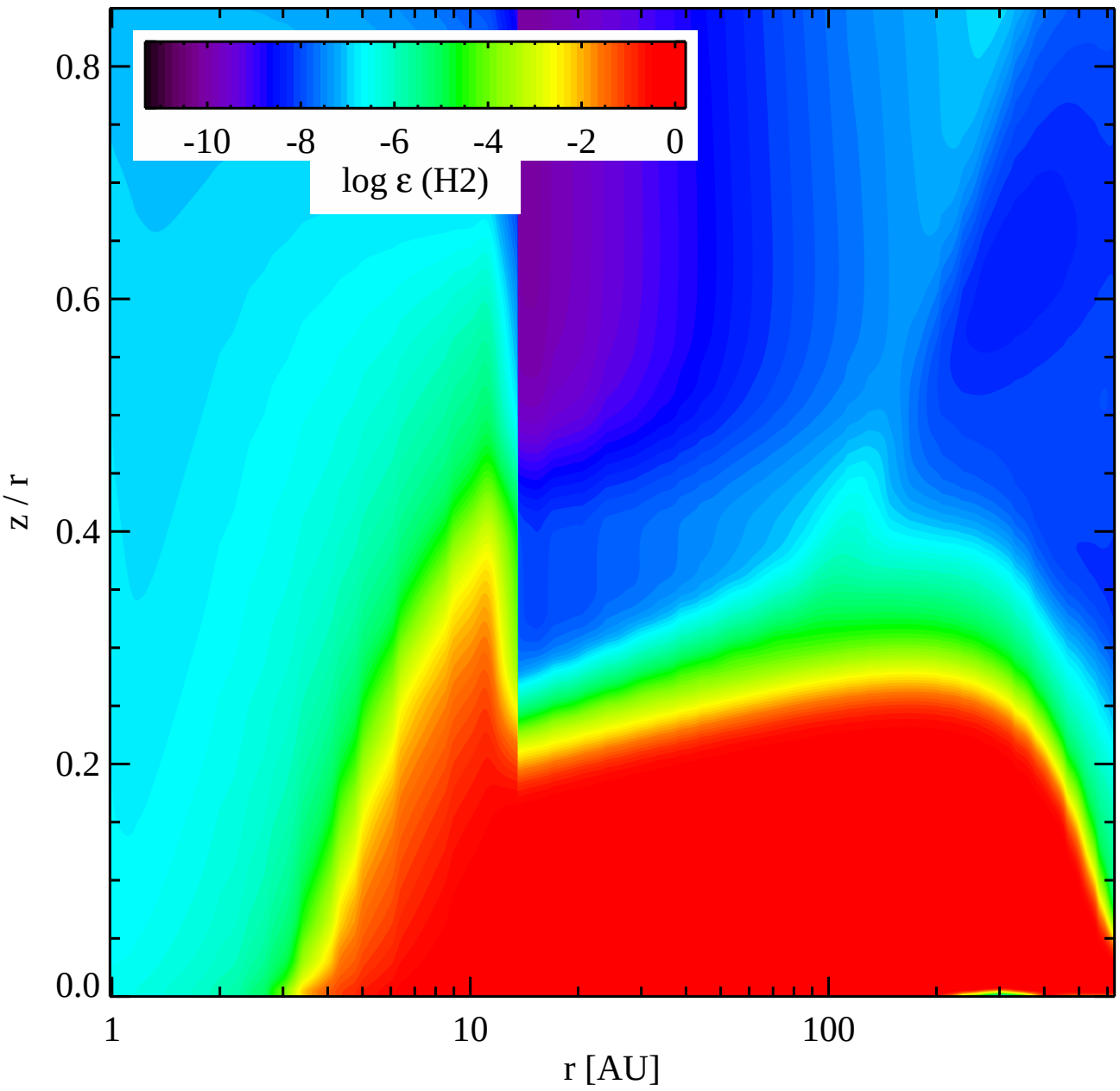

λ = 1326.50 μm
-13
-14
-15
-16
log <I_ν> [erg/s/cm²/Hz/sr]
0
100
200
300
400
r [AU]
model profile
model after convolution
observations

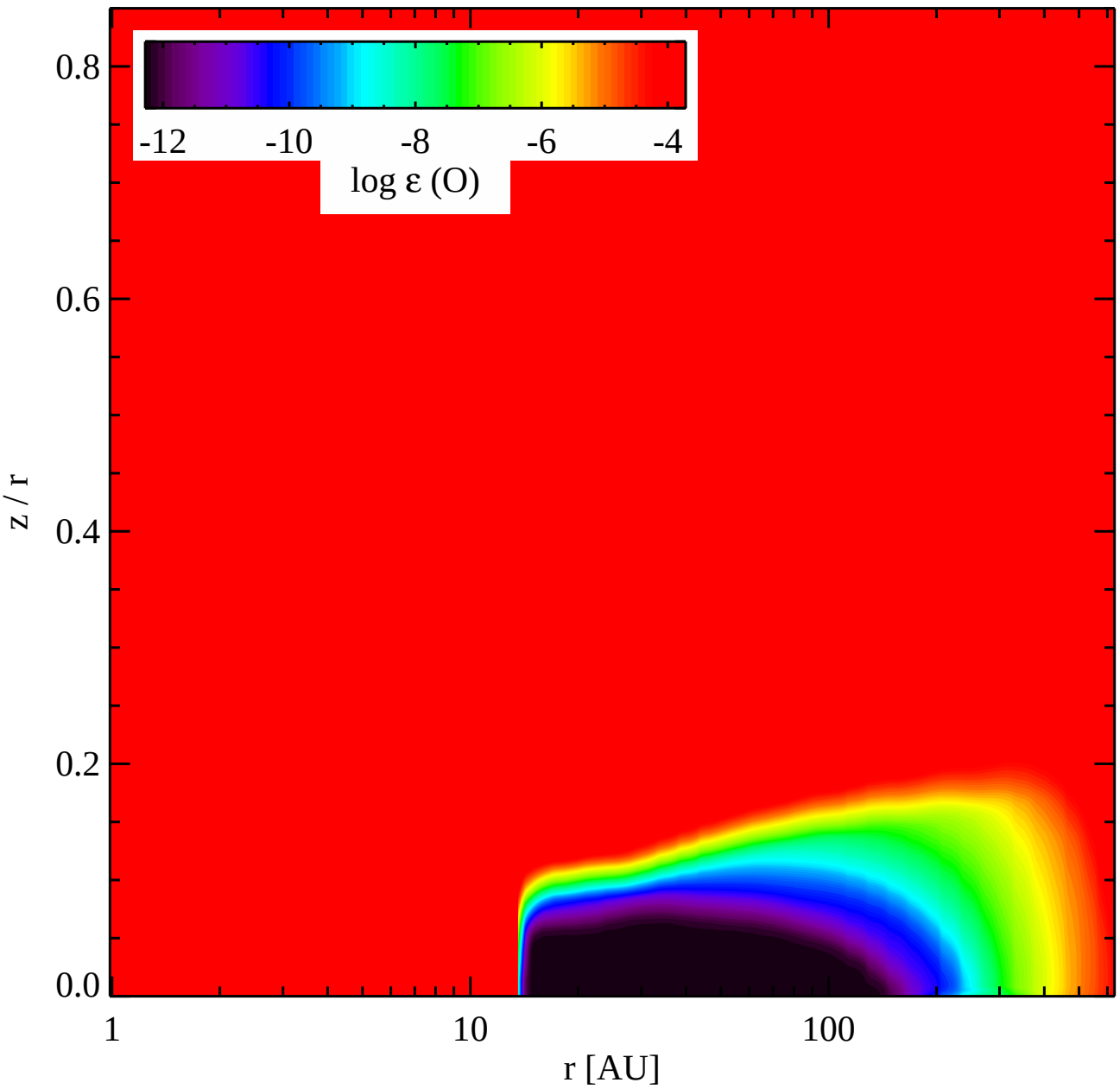

λ = 1326.50 μm
model profile
model after convolution
observations
3×10-14
2×10-14
1×10-14
0
<Iν> [erg/s/cm2/Hz/sr]
0
100
200
300
400
r [AU]

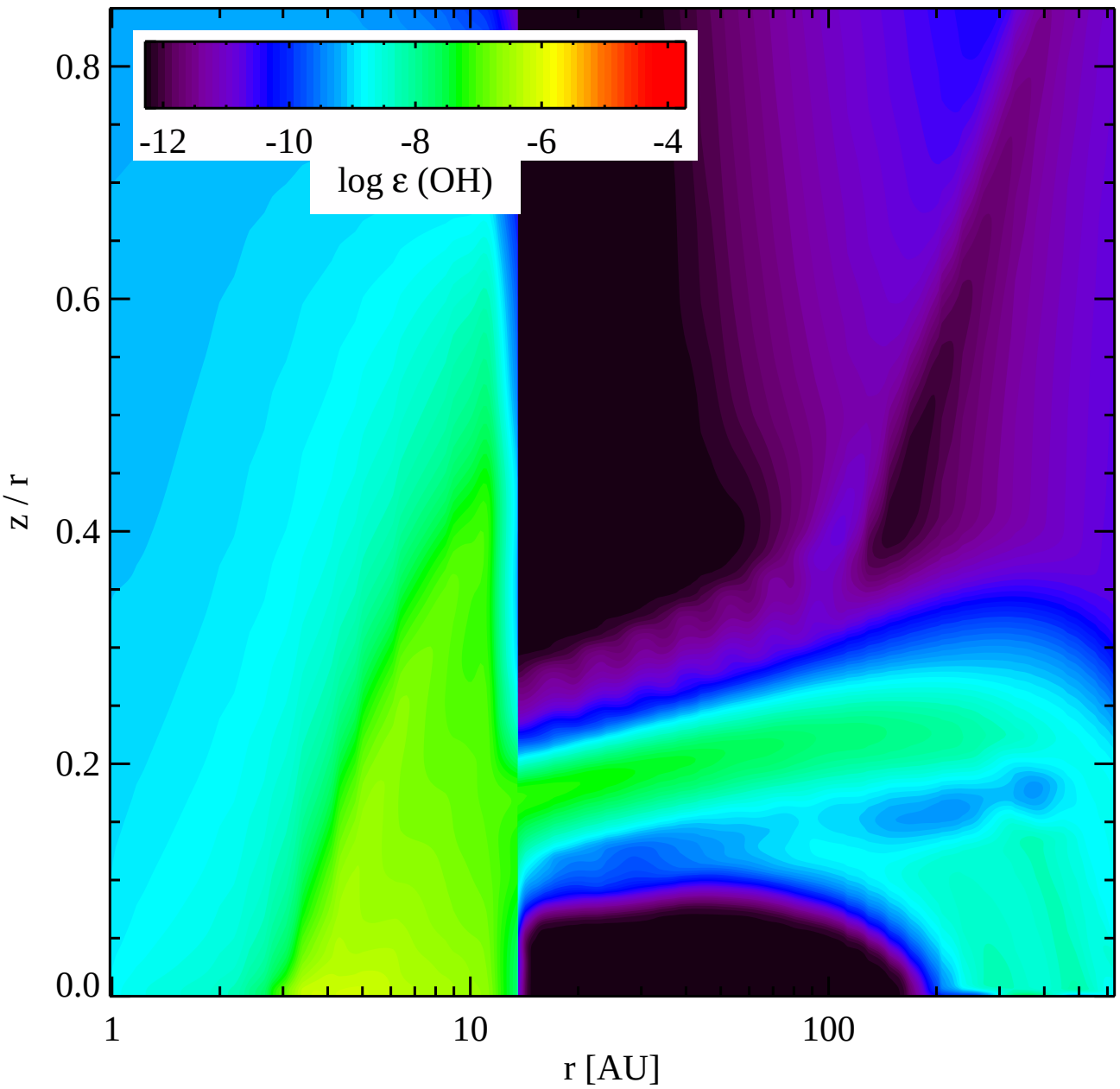

-8
-6
-4
-2
0
log ε (elec)
AV=1
10
0.0
0.2
0.4
0.6
0.8
z / r
1
10
100
r [AU]

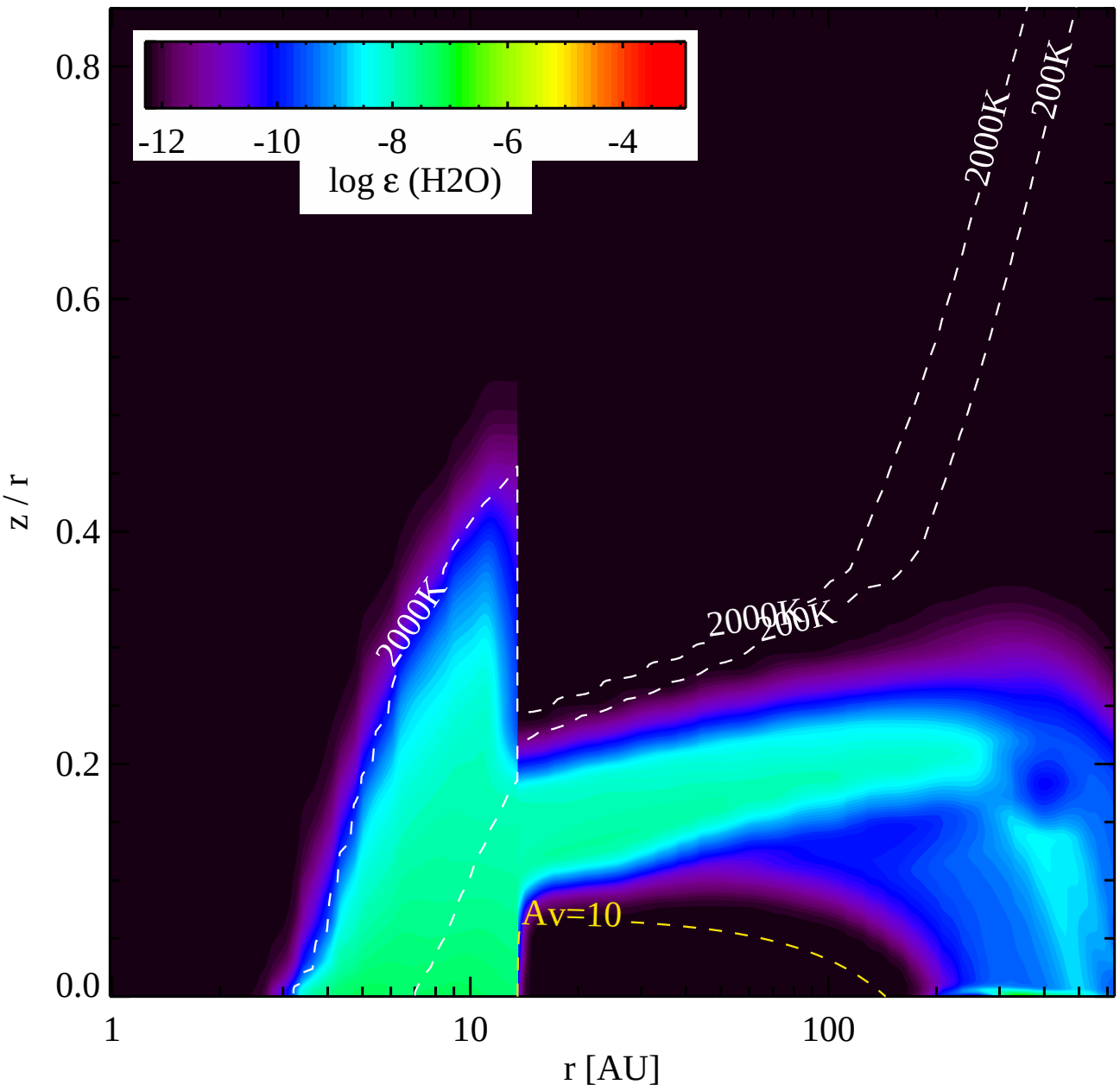

-10
-8
-6
-4
-2
0
log ε (H+)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

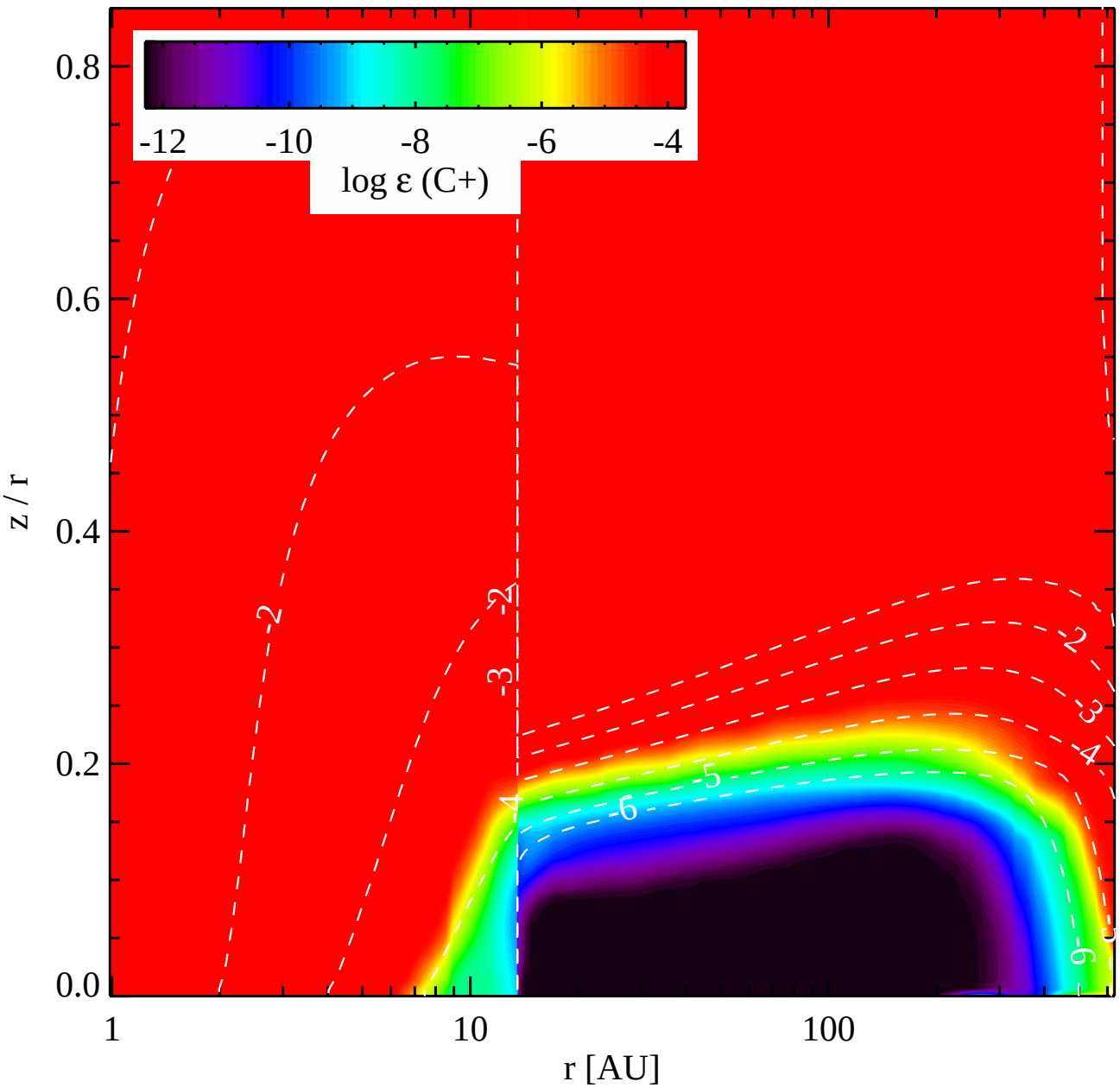

-8
-6
-4
-2
0
log ε (H)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

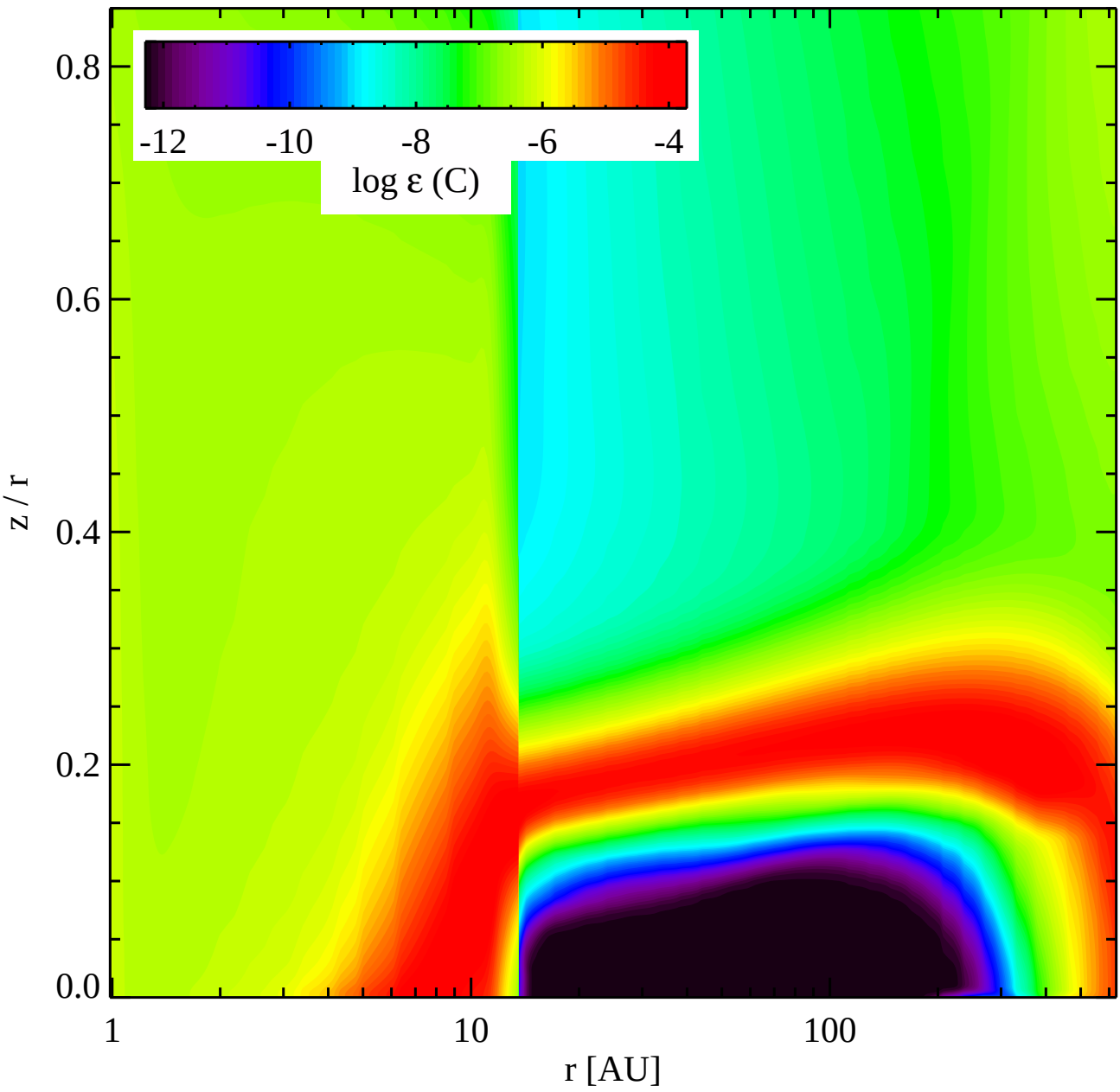

-10
-8
-6
-4
-2
0
log ε (H2)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

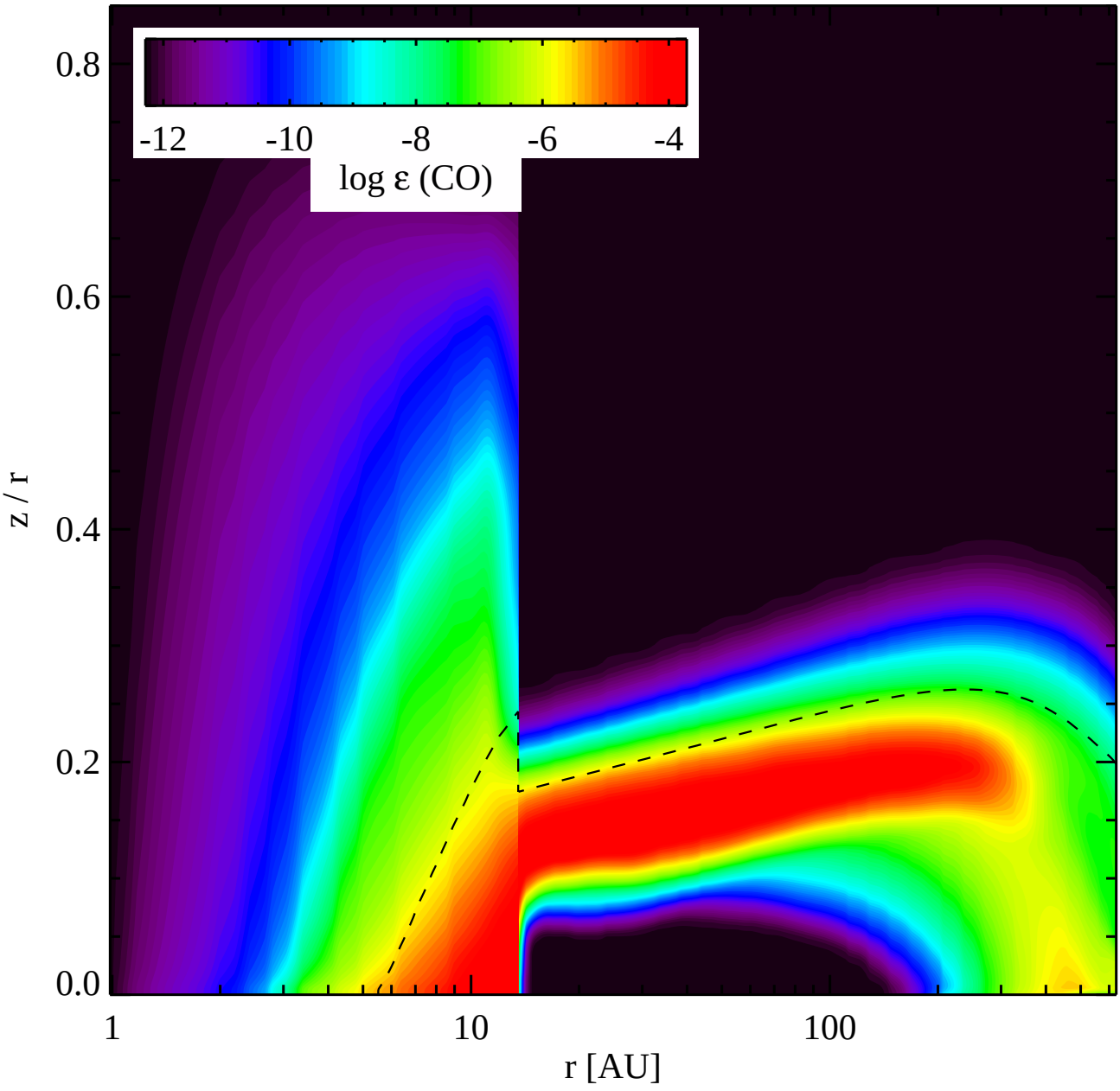

-12
-10
-8
-6
-4
log ε (O)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

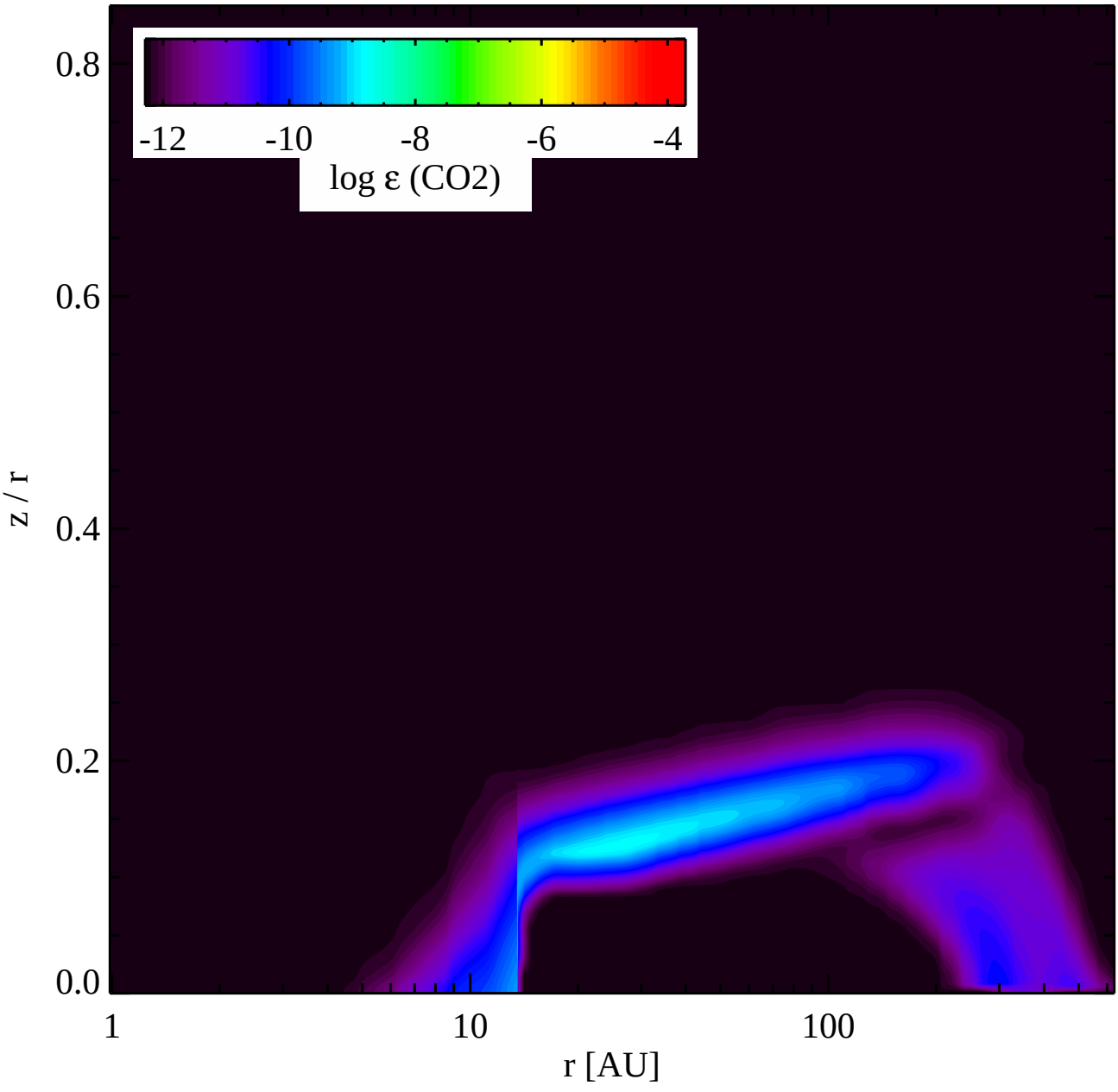

-12
-10
-8
-6
-4
log ε (OH)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

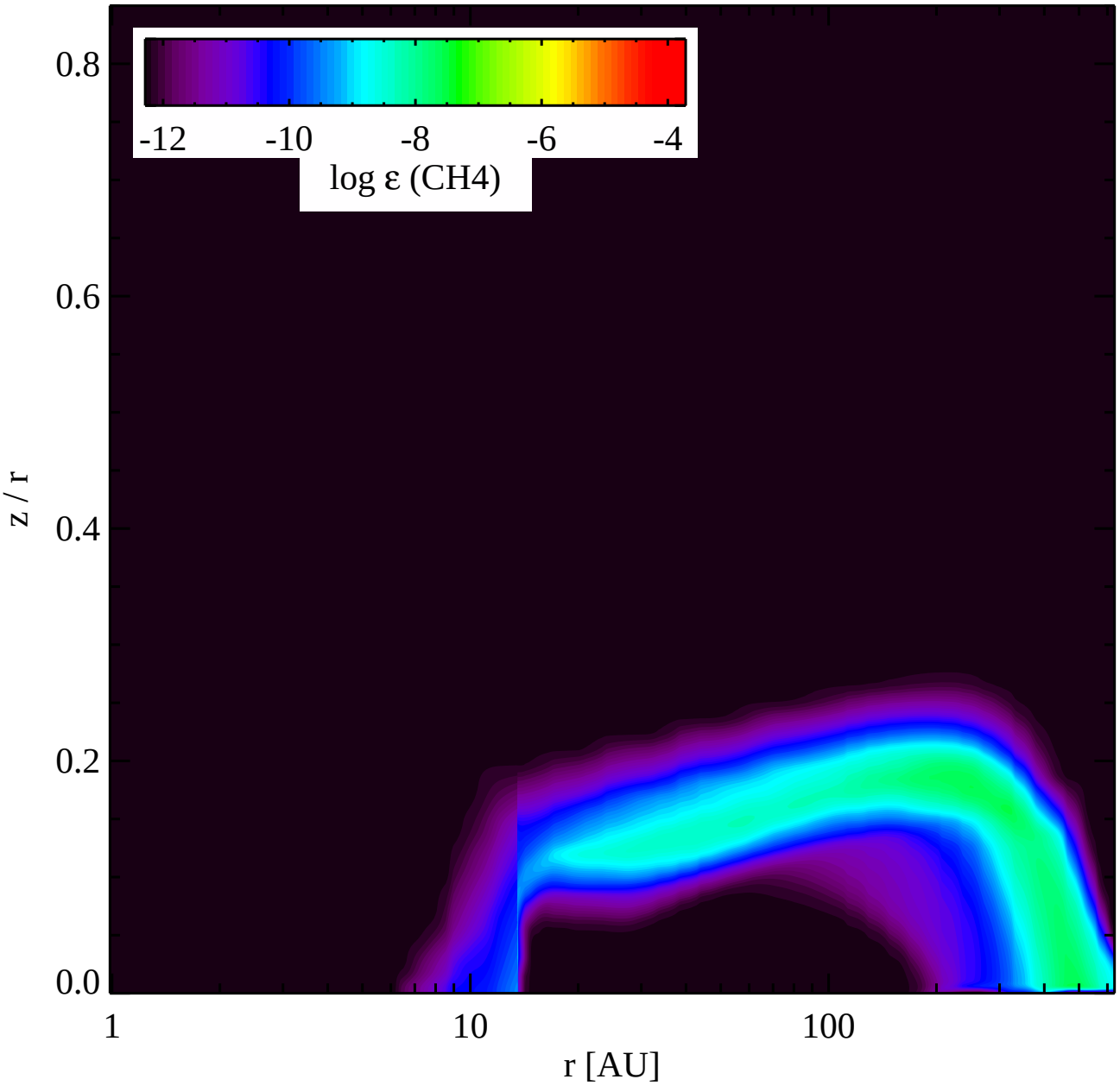

-12
-10
-8
-6
-4
log ε (H2O)
2000K
200K
2000K
200K
Av=10
0.0
0.2
0.4
0.6
0.8
z / r
1
10
100
r [AU]

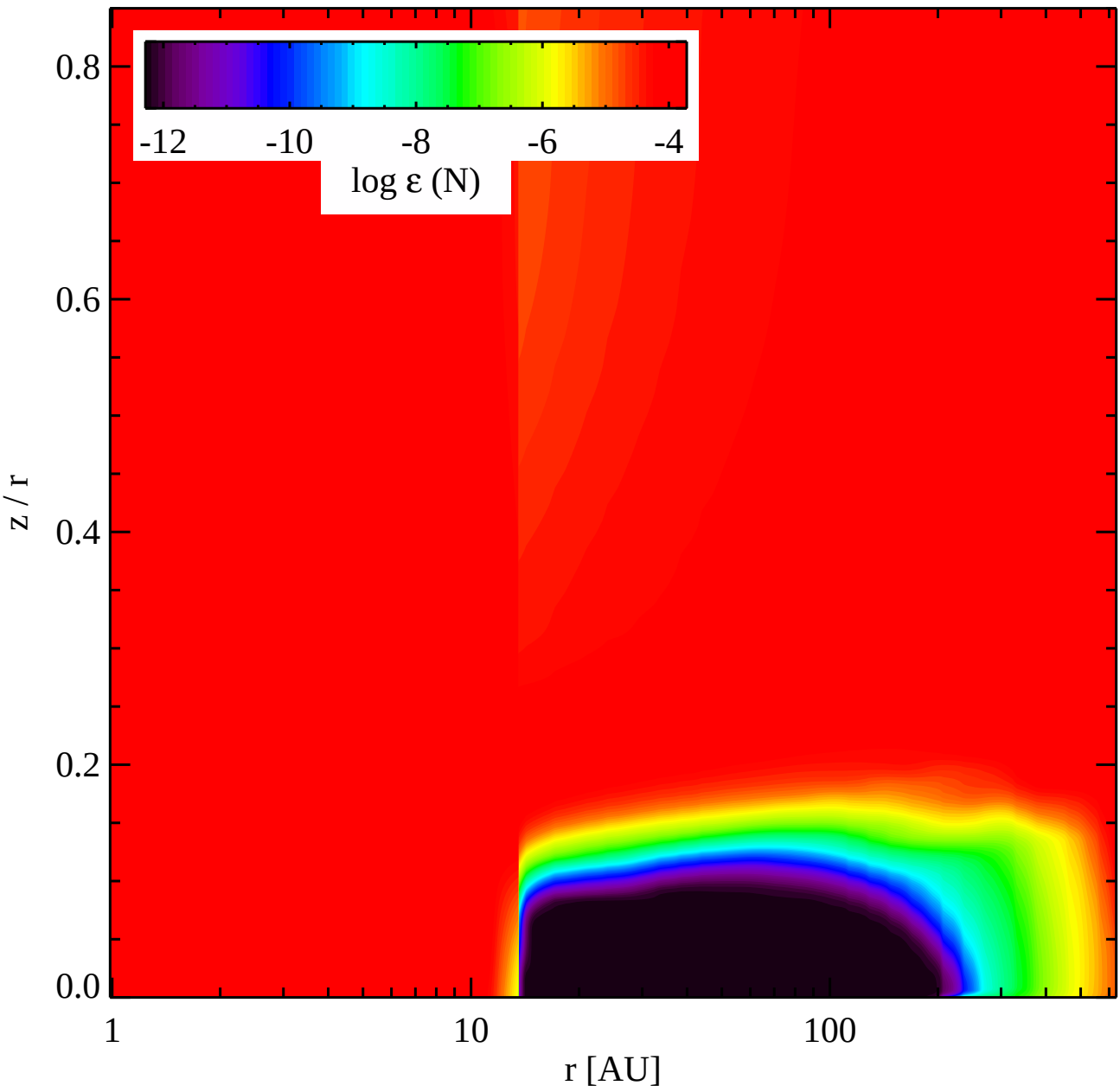

-12
-10
-8
-6
-4
log ε (C+)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
-2
-2
-3
-2
-3
-4
-5
-6
-4
-6
-5

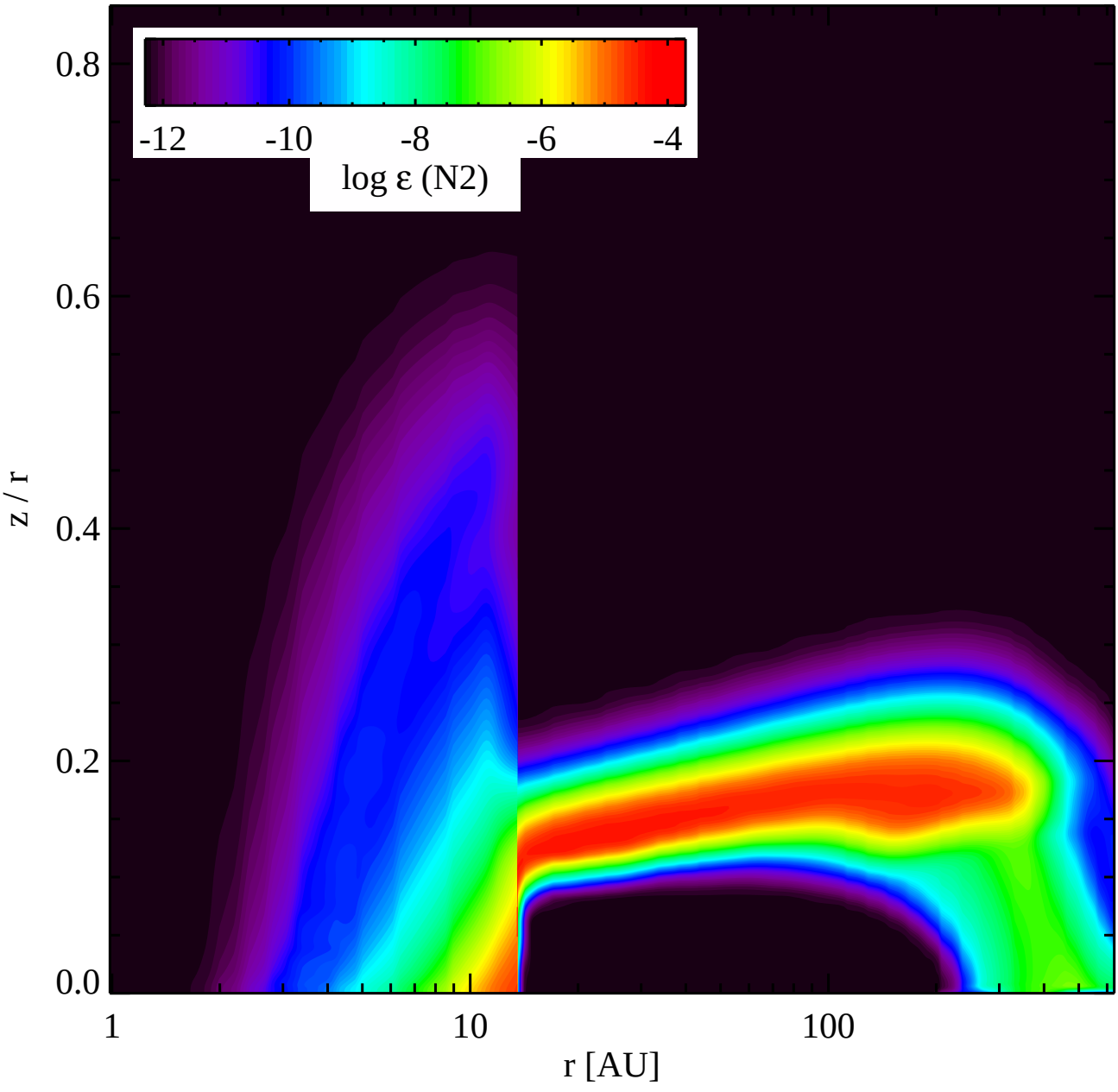

-12
-10
-8
-6
-4
log ε (C)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

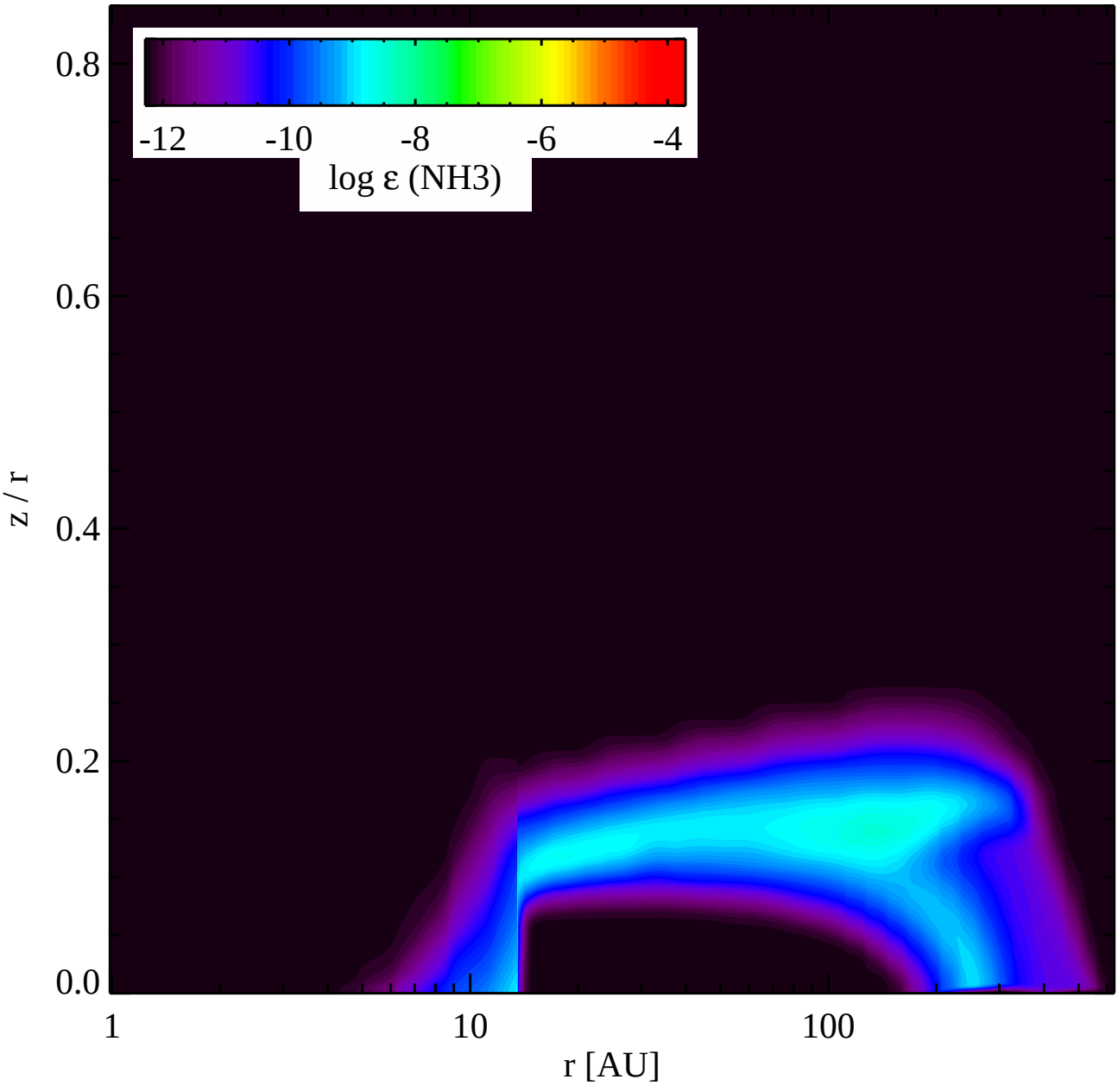

-12
-10
-8
-6
-4
log ε (CO)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

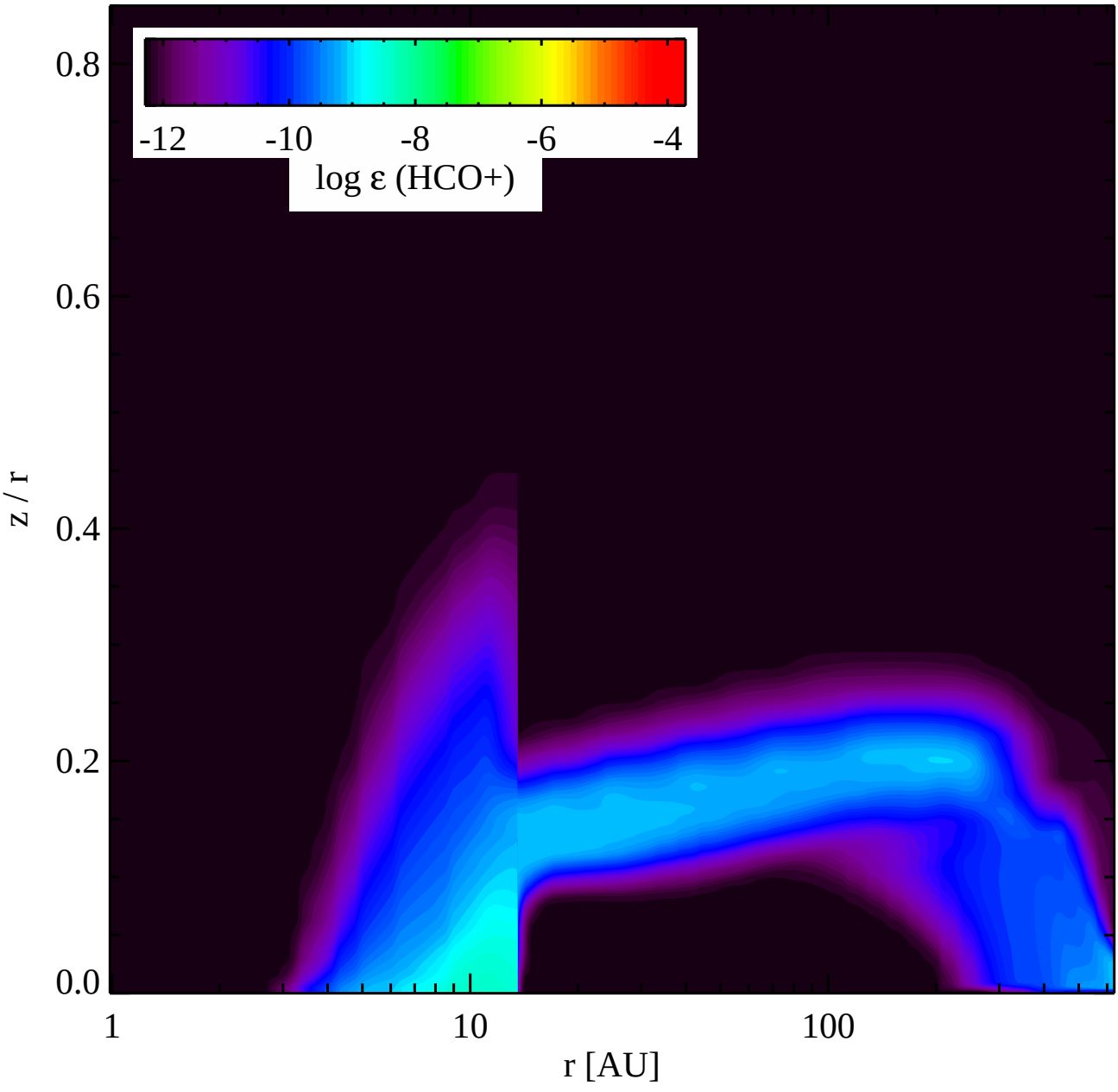

-12
-10
-8
-6
-4
log ε (CO2)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

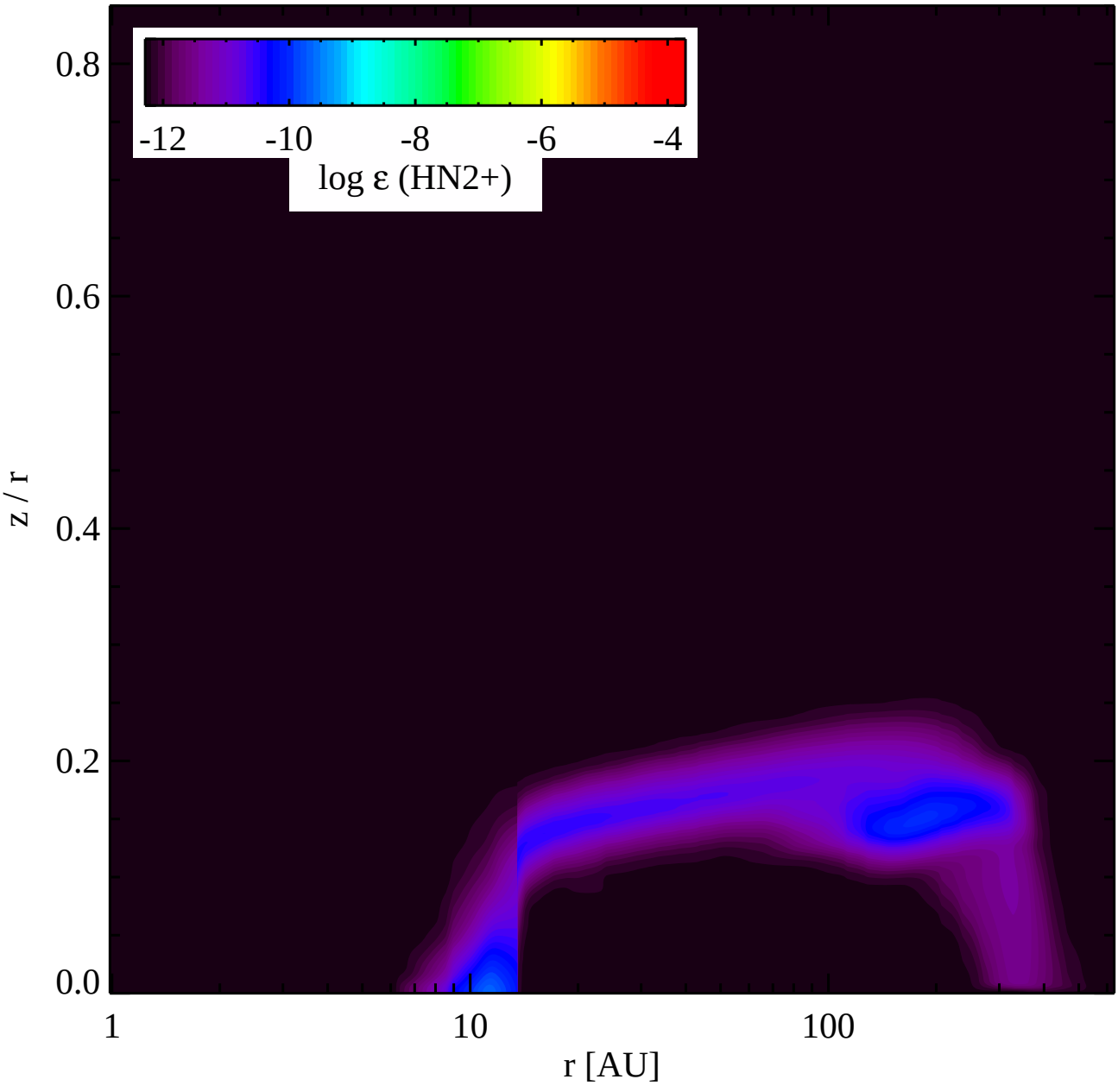

-12
-10
-8
-6
-4
log ε (CH4)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

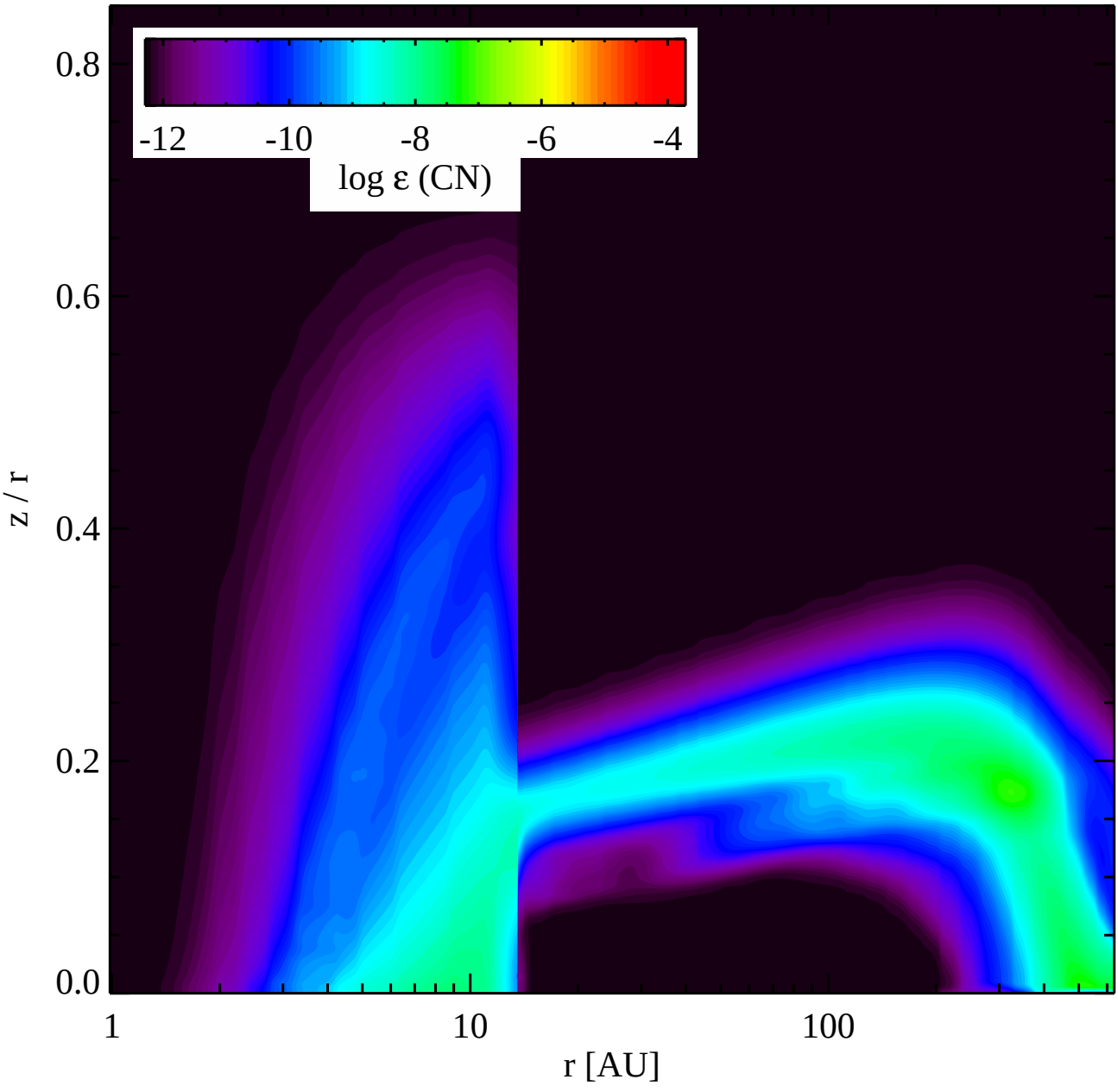

-12
-10
-8
-6
-4
log ε (N)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

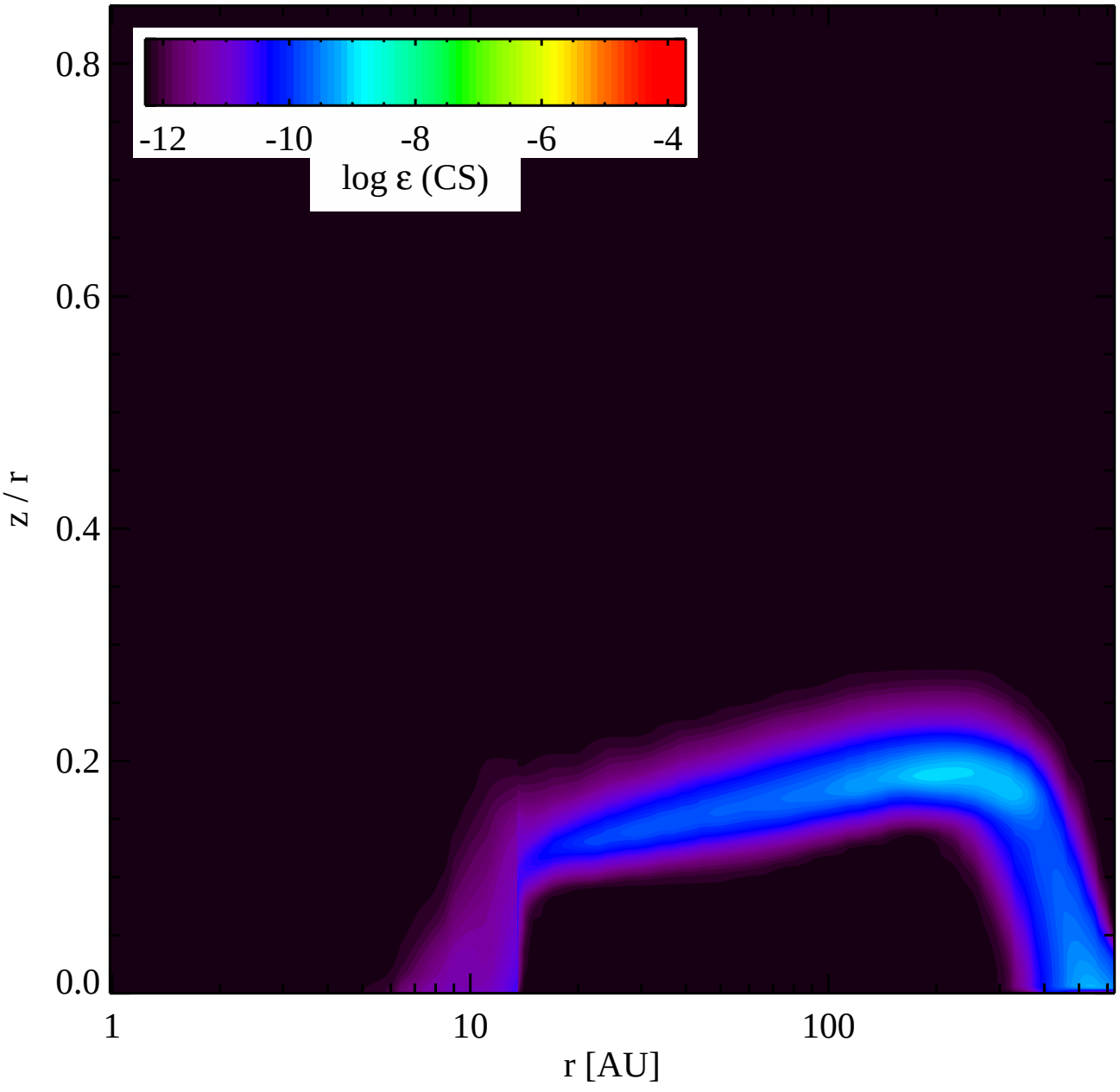

-12
-10
-8
-6
-4
log ε (N2)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

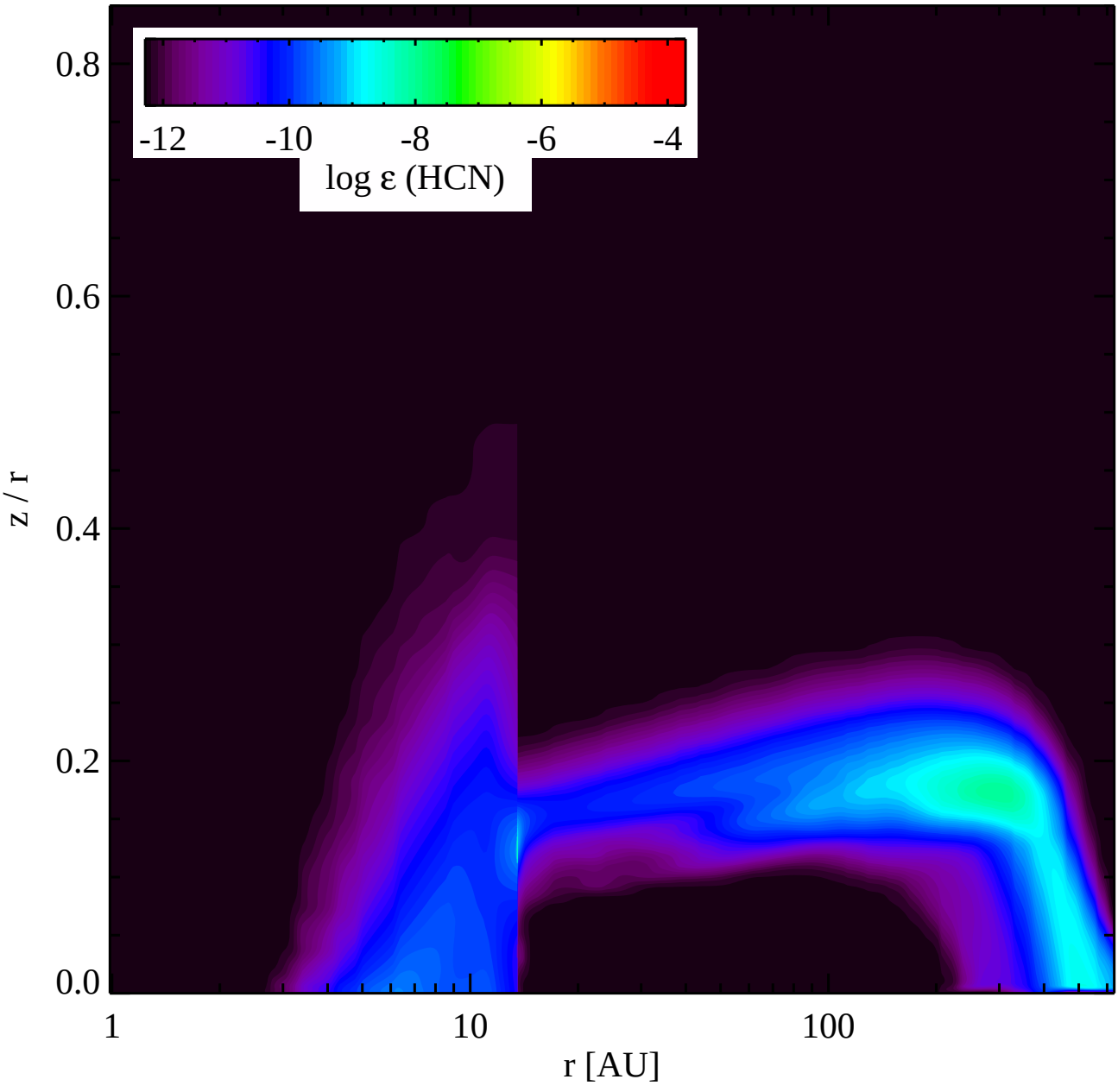

-12
-10
-8
-6
-4
log ε (NH3)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

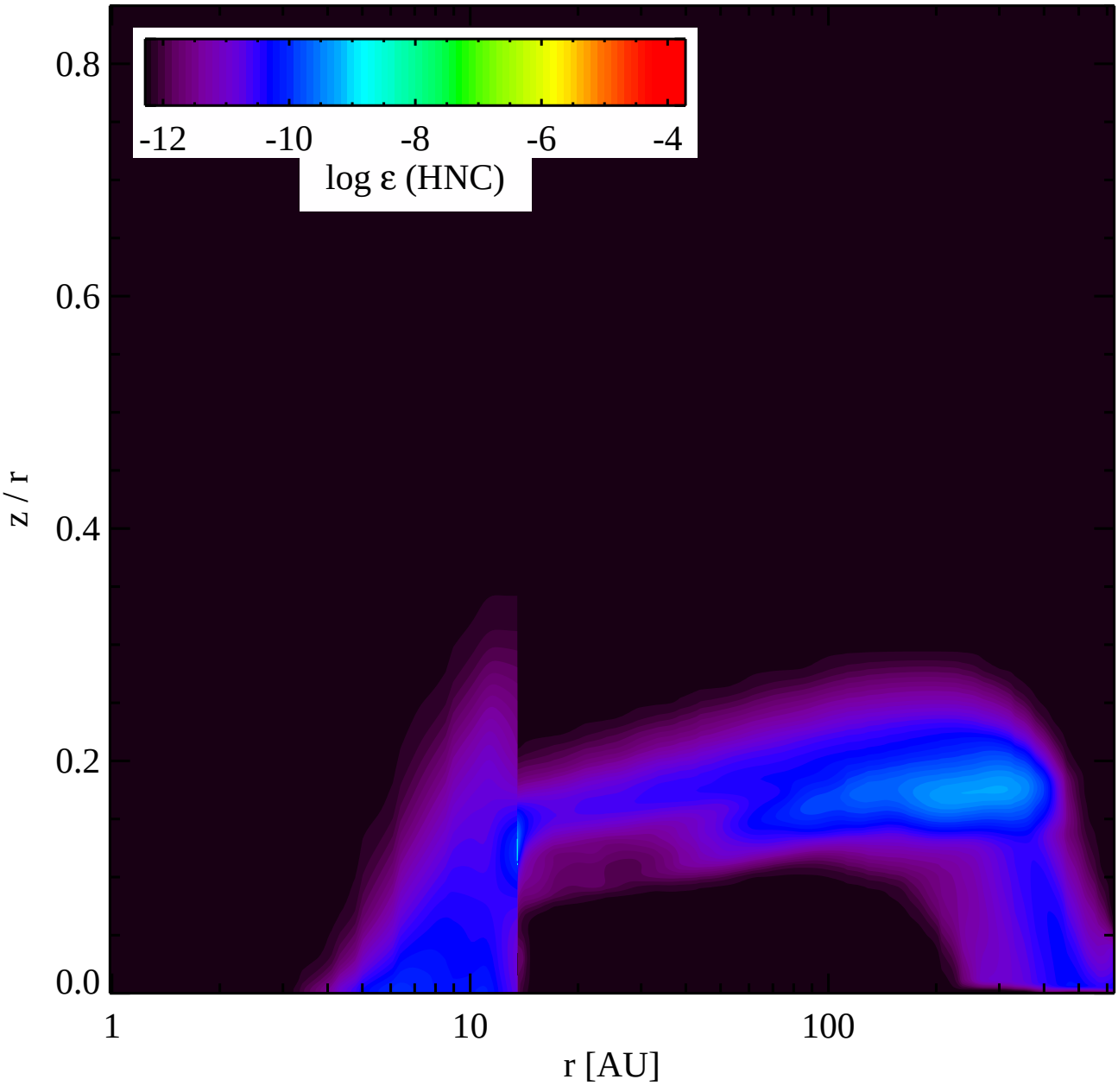

-12
-10
-8
-6
-4
log ε (HCO+)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

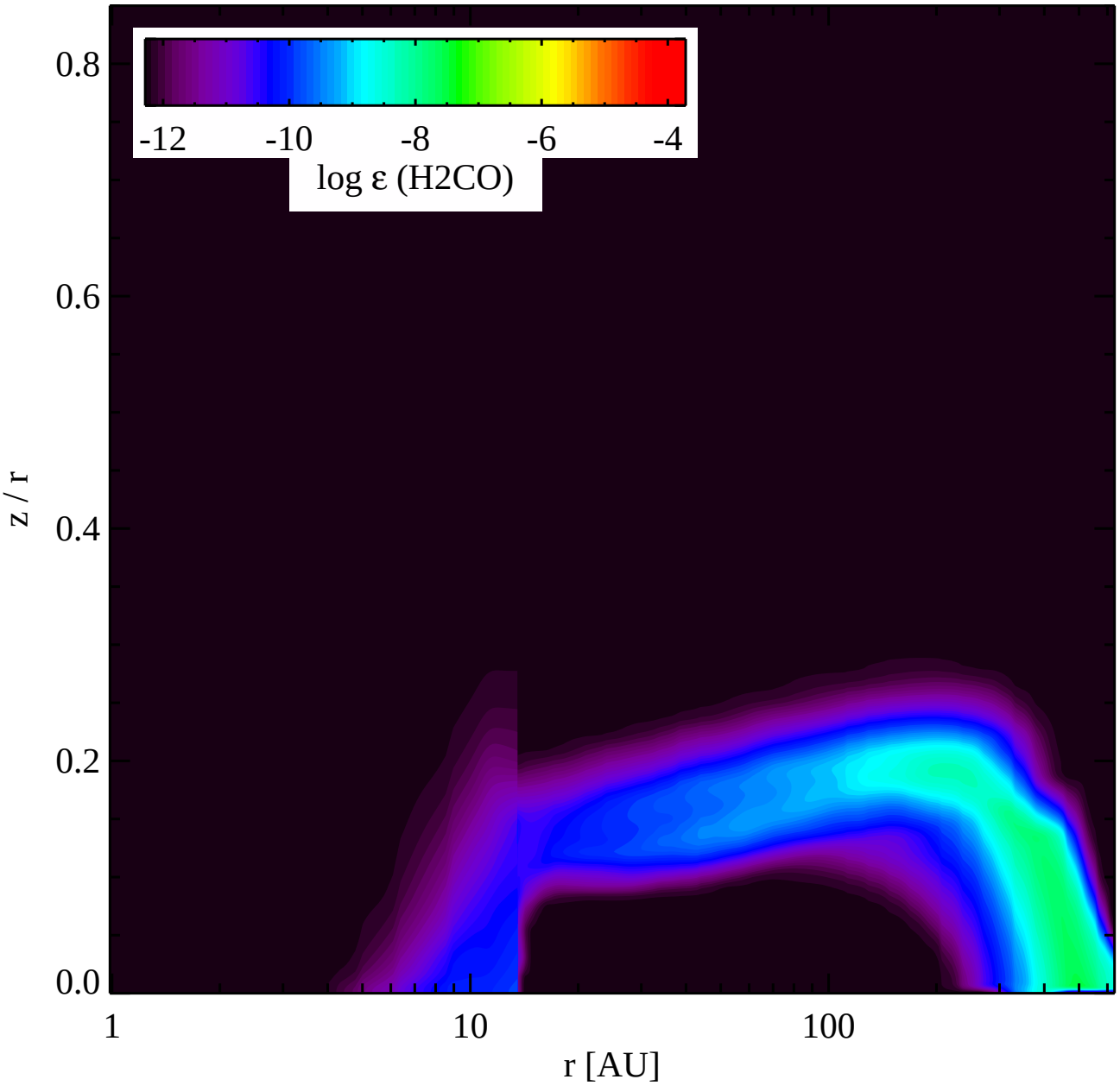

-12
-10
-8
-6
-4
log ε (HN2+)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

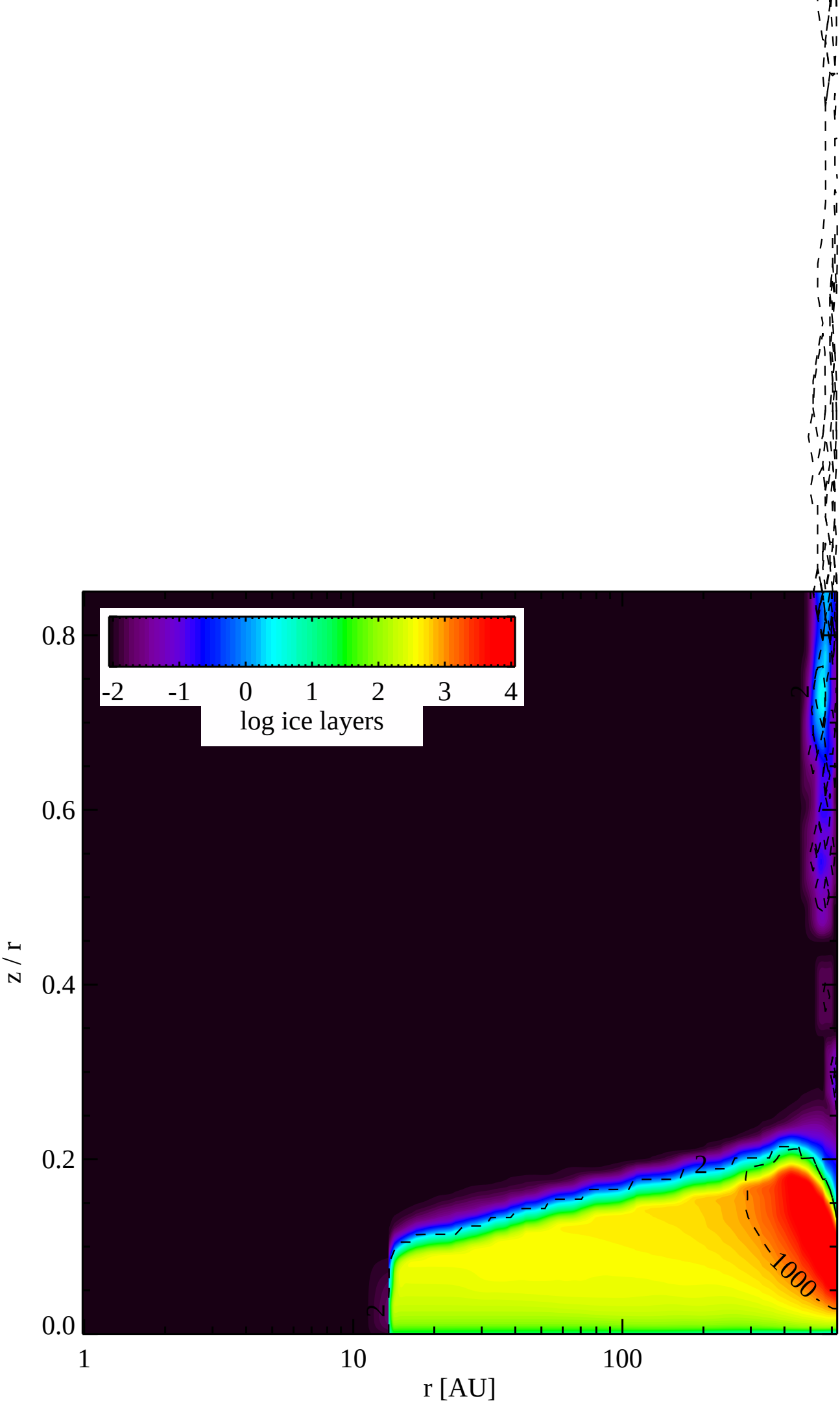

-12
-10
-8
-6
-4
log ε (CN)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

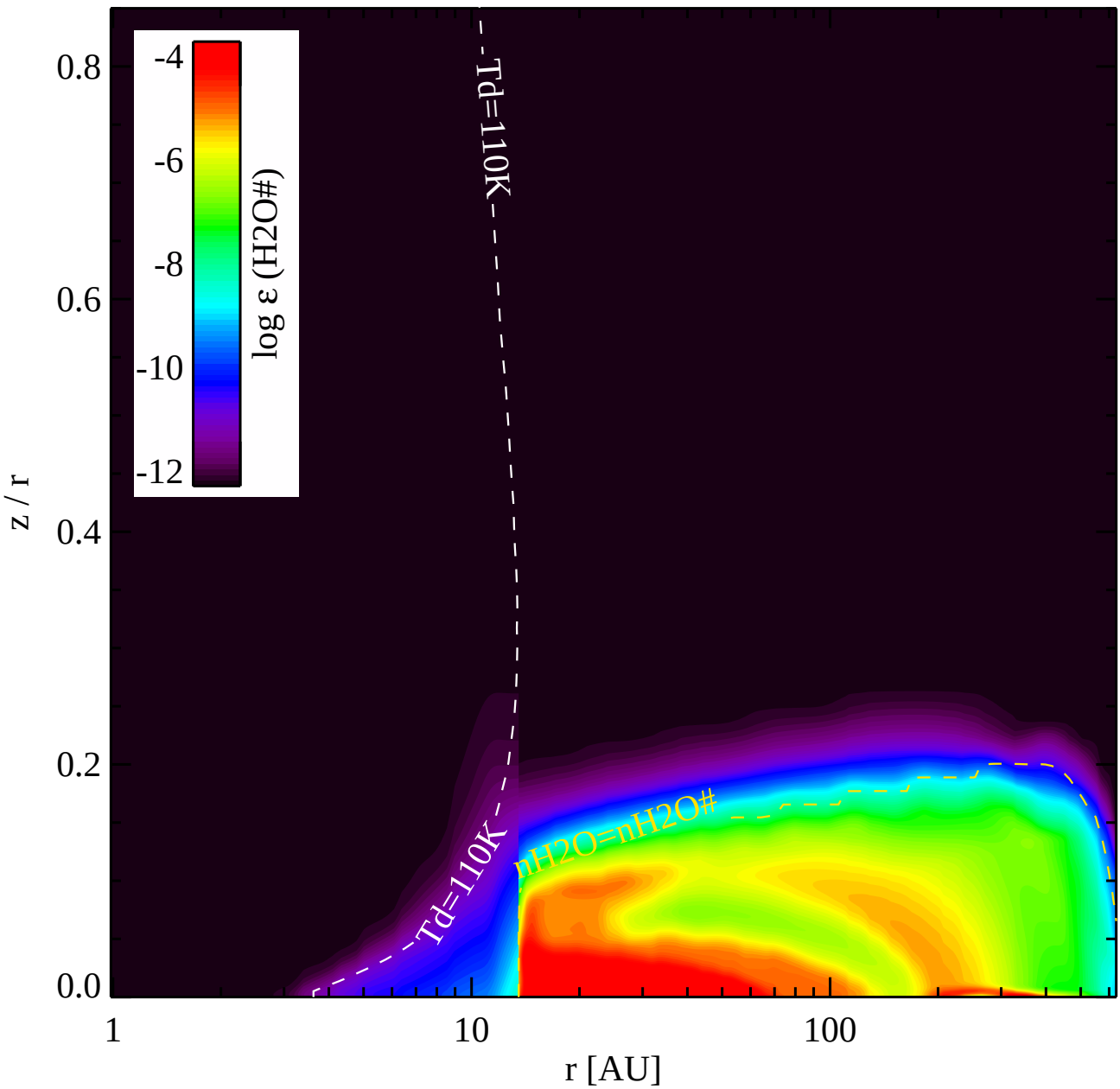

-12
-10
-8
-6
-4
log ε (CS)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

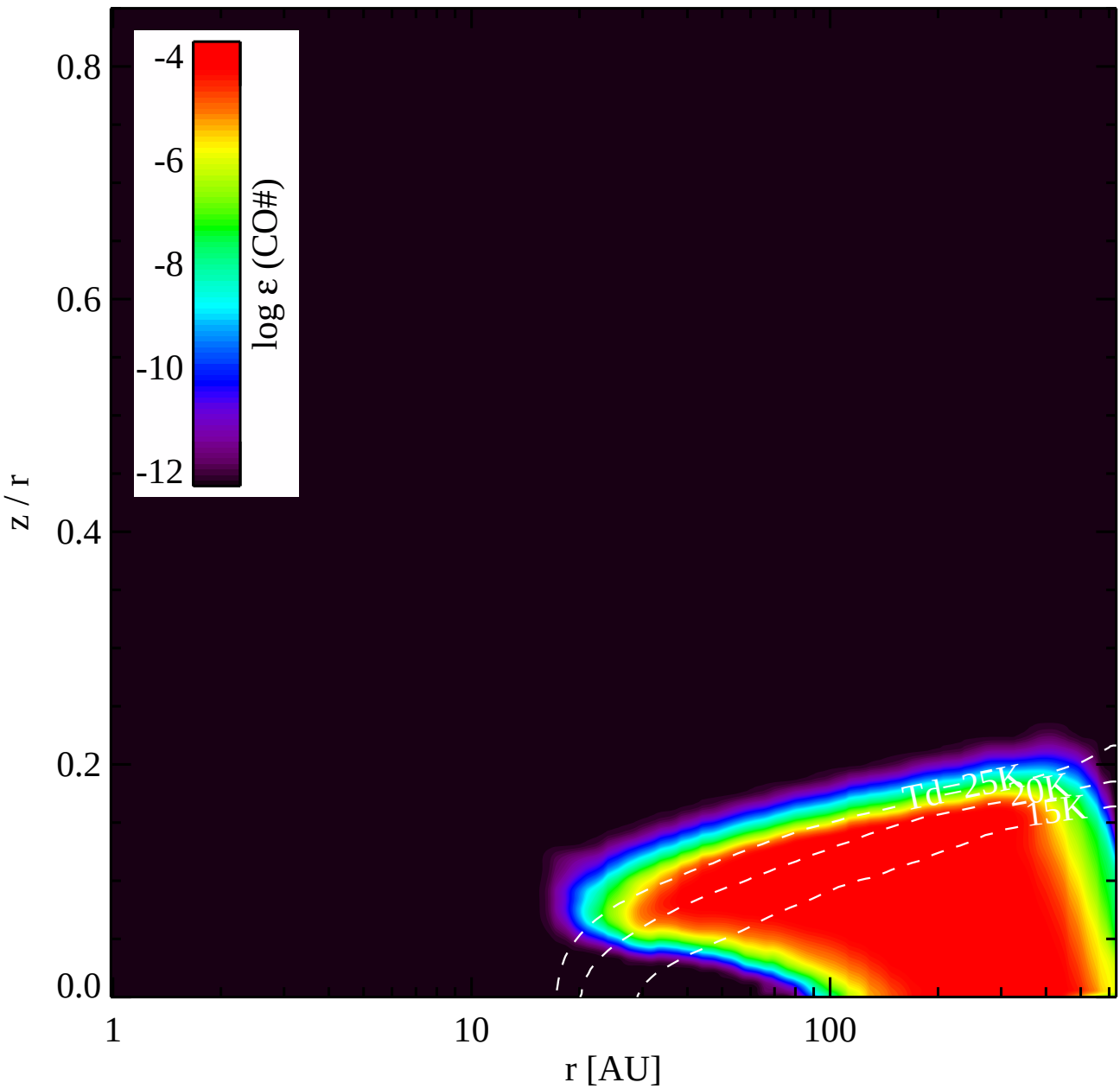

-12
-10
-8
-6
-4
log ε (HCN)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

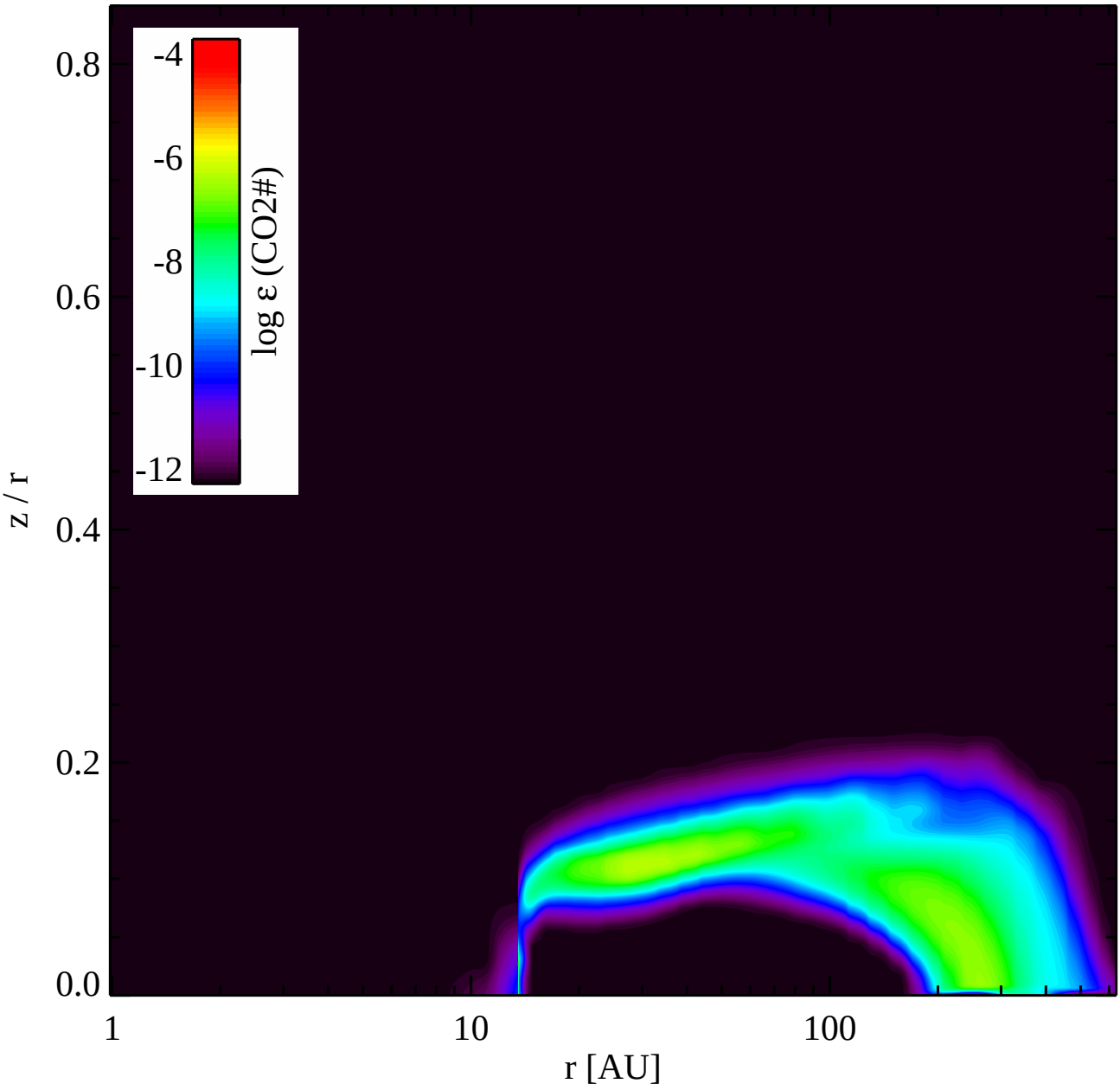

-12
-10
-8
-6
-4
log ε (HNC)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

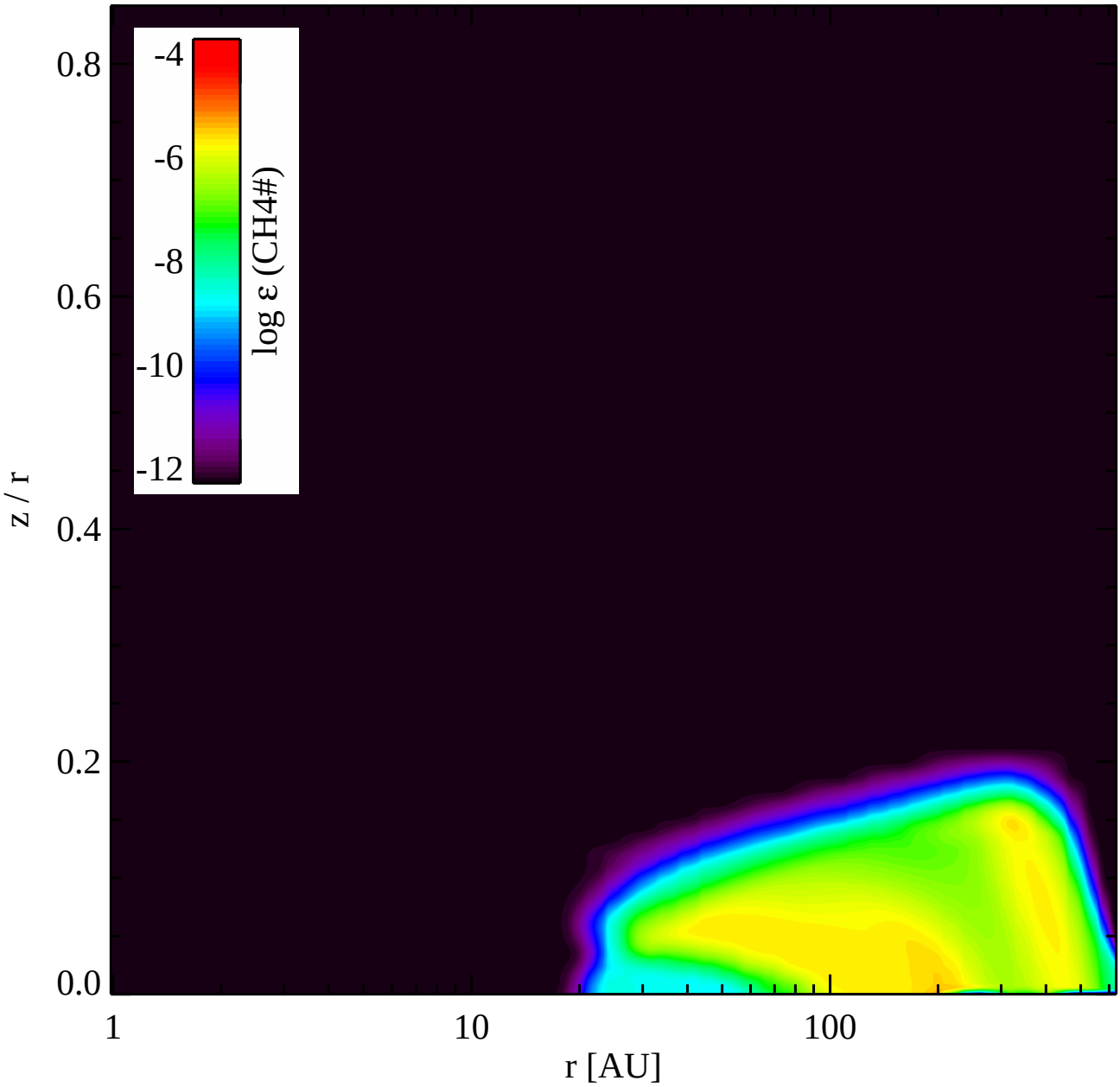

-12
-10
-8
-6
-4
log ε (H2CO)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

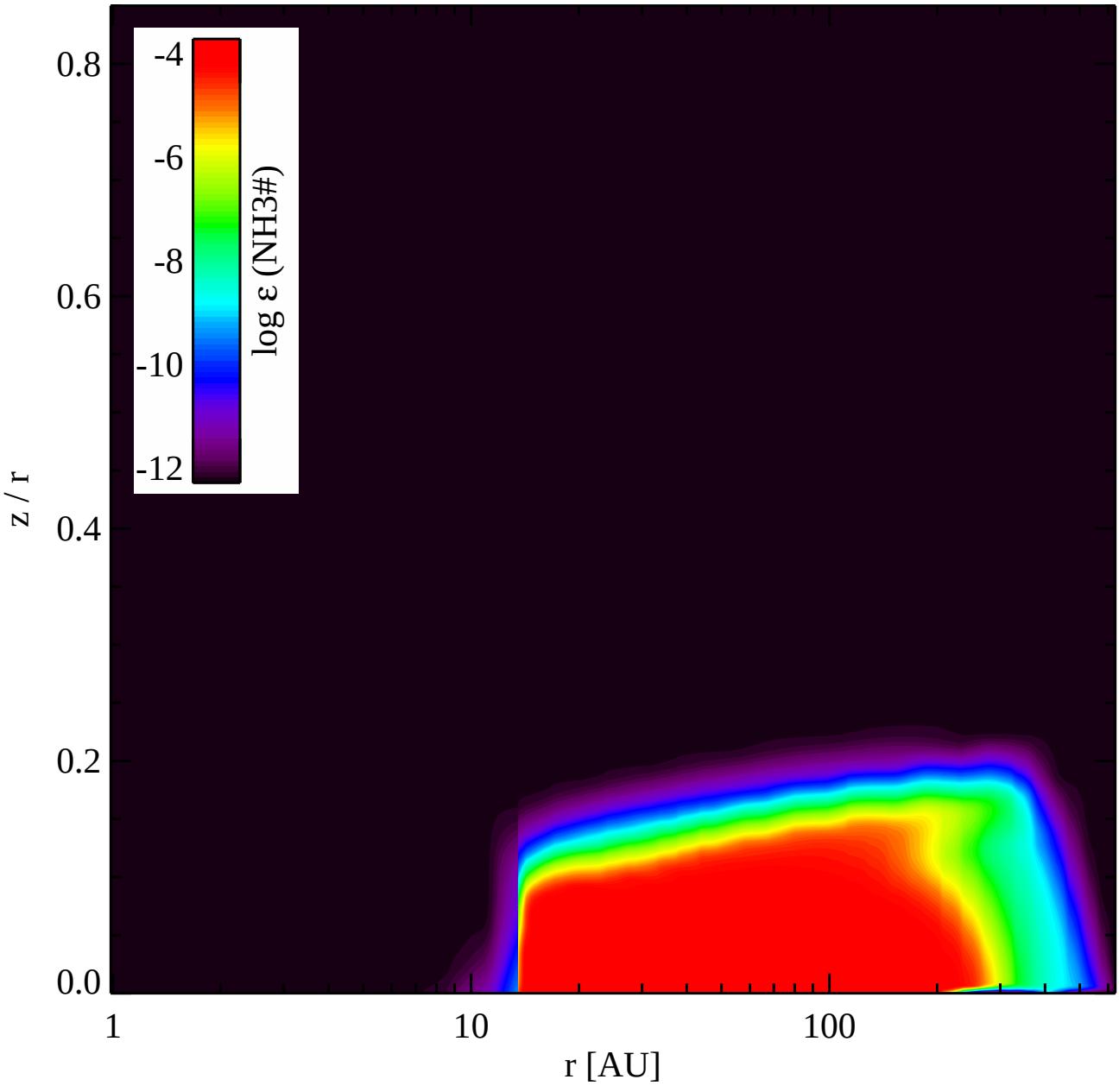

-2
-1
0
1
2
3
4
log ice layers
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
2
2
2
1000

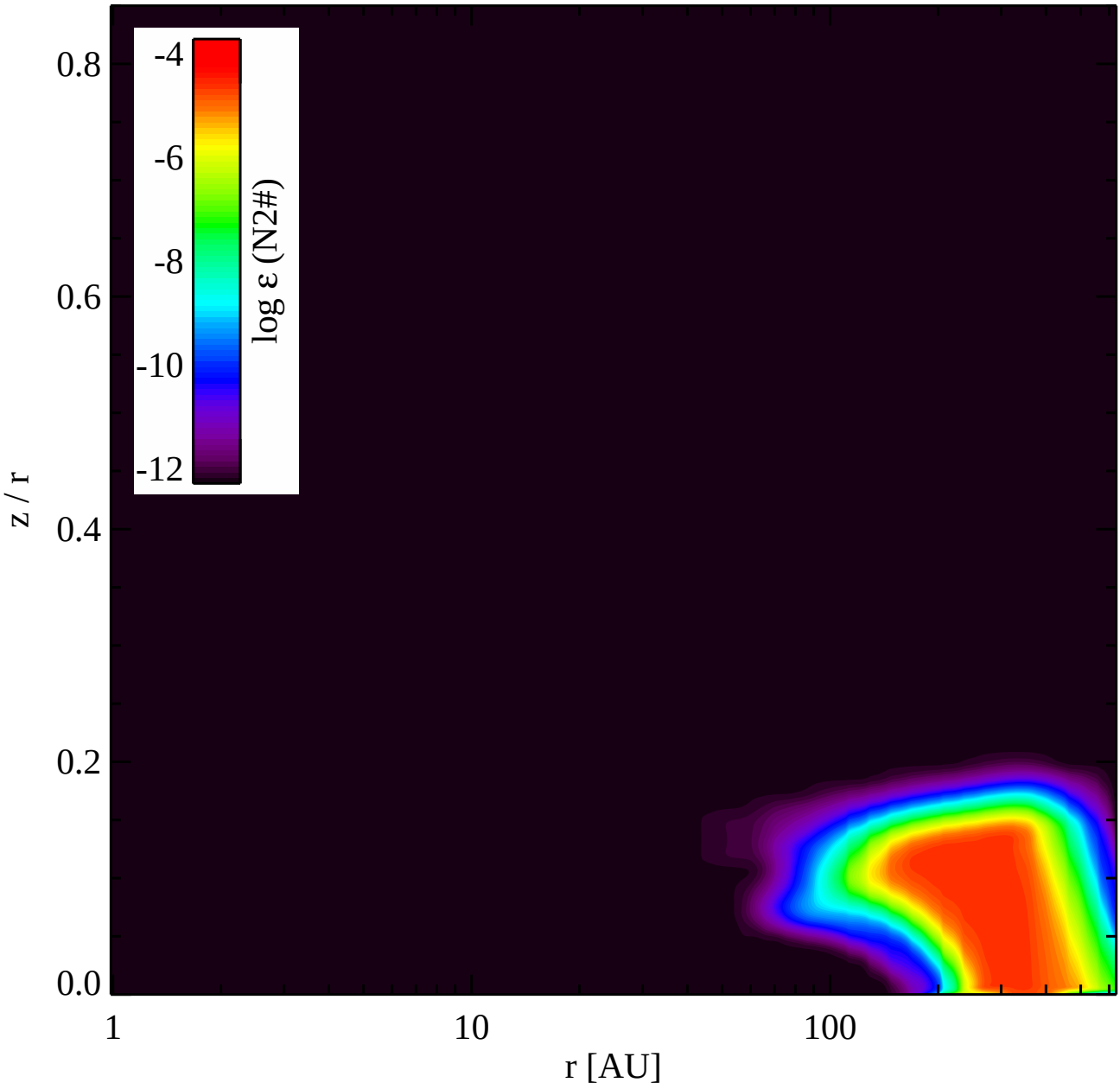

-4
-6
-8
-10
-12
log ε (H2O#)
Td=110K
Td=110K
nH2O=nH2O#
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

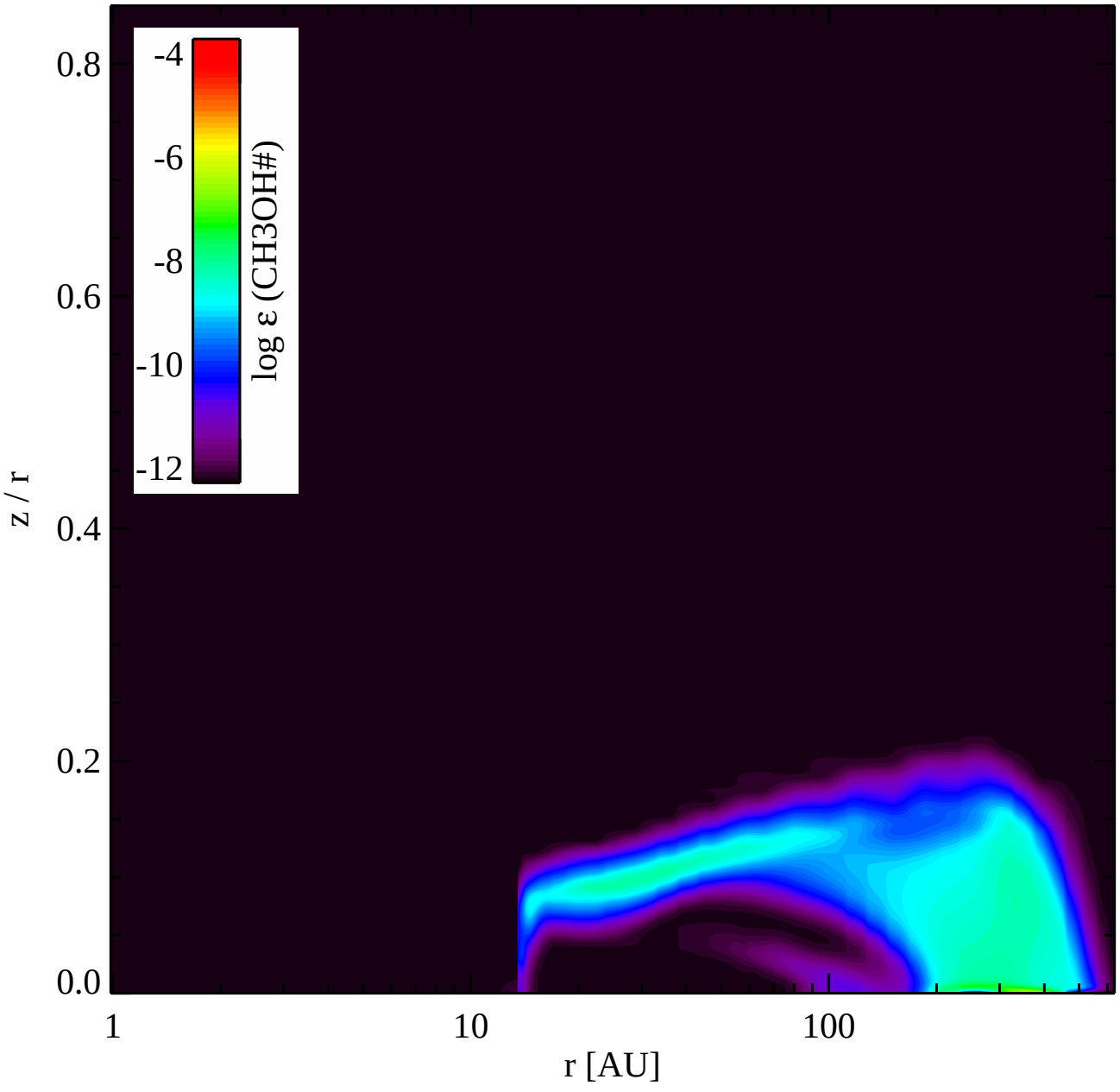

-4
-6
-8
-10
-12
log ε (CO#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]
Td=25K
20K
15K

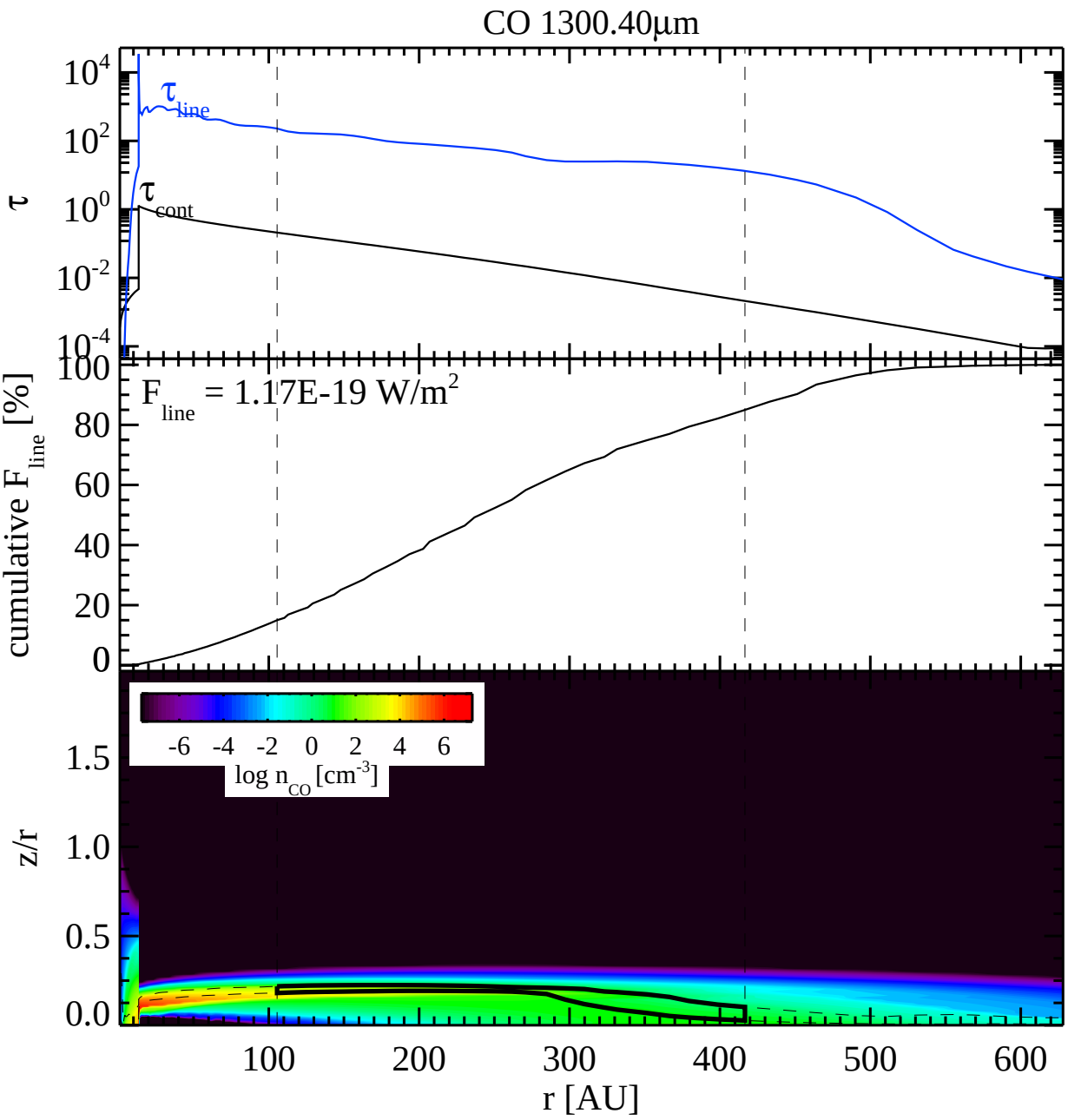

-4
-6
-8
-10
-12
log ε (CO2#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

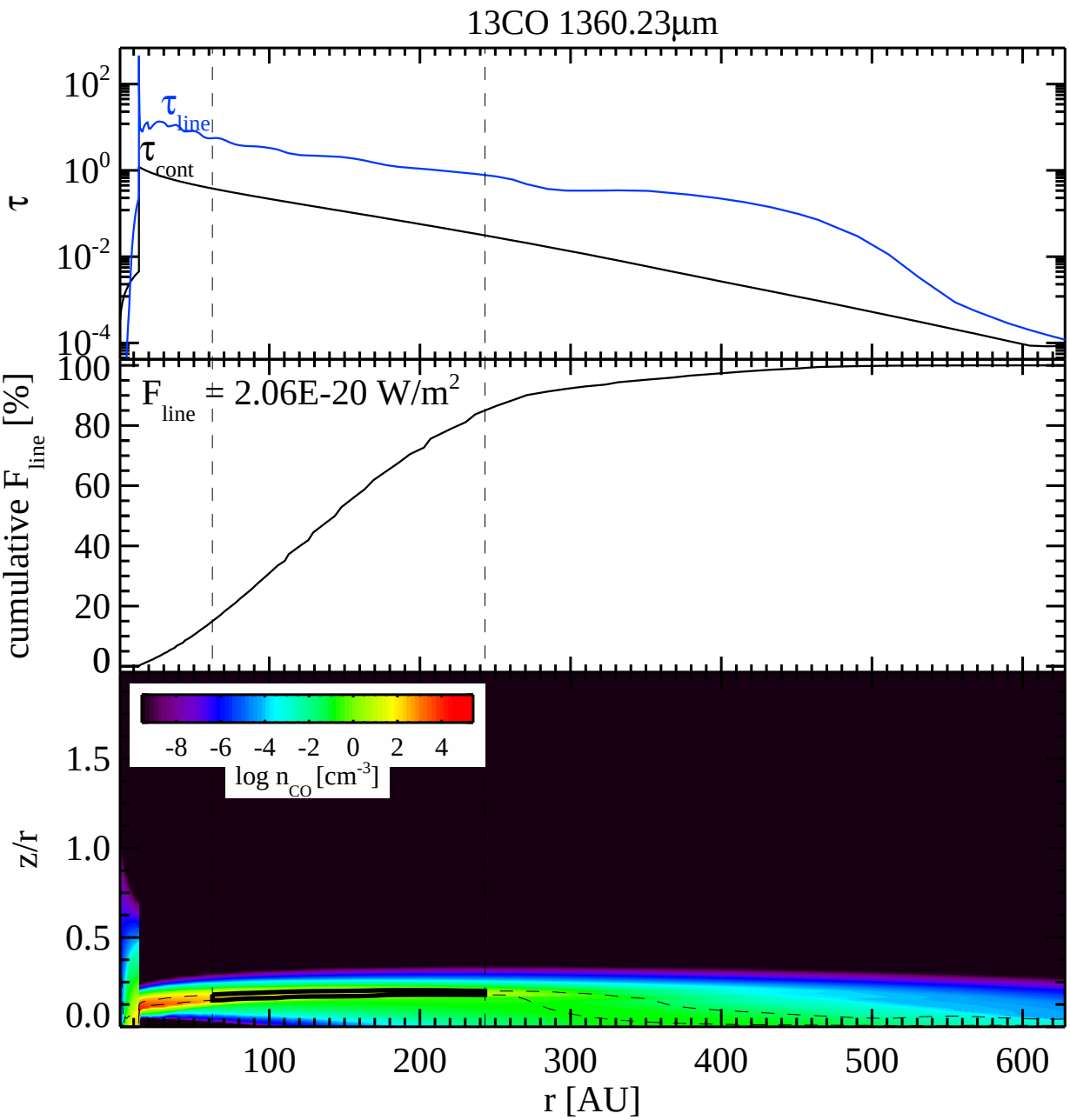

-4
-6
-8
-10
-12
log ε (CH4#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

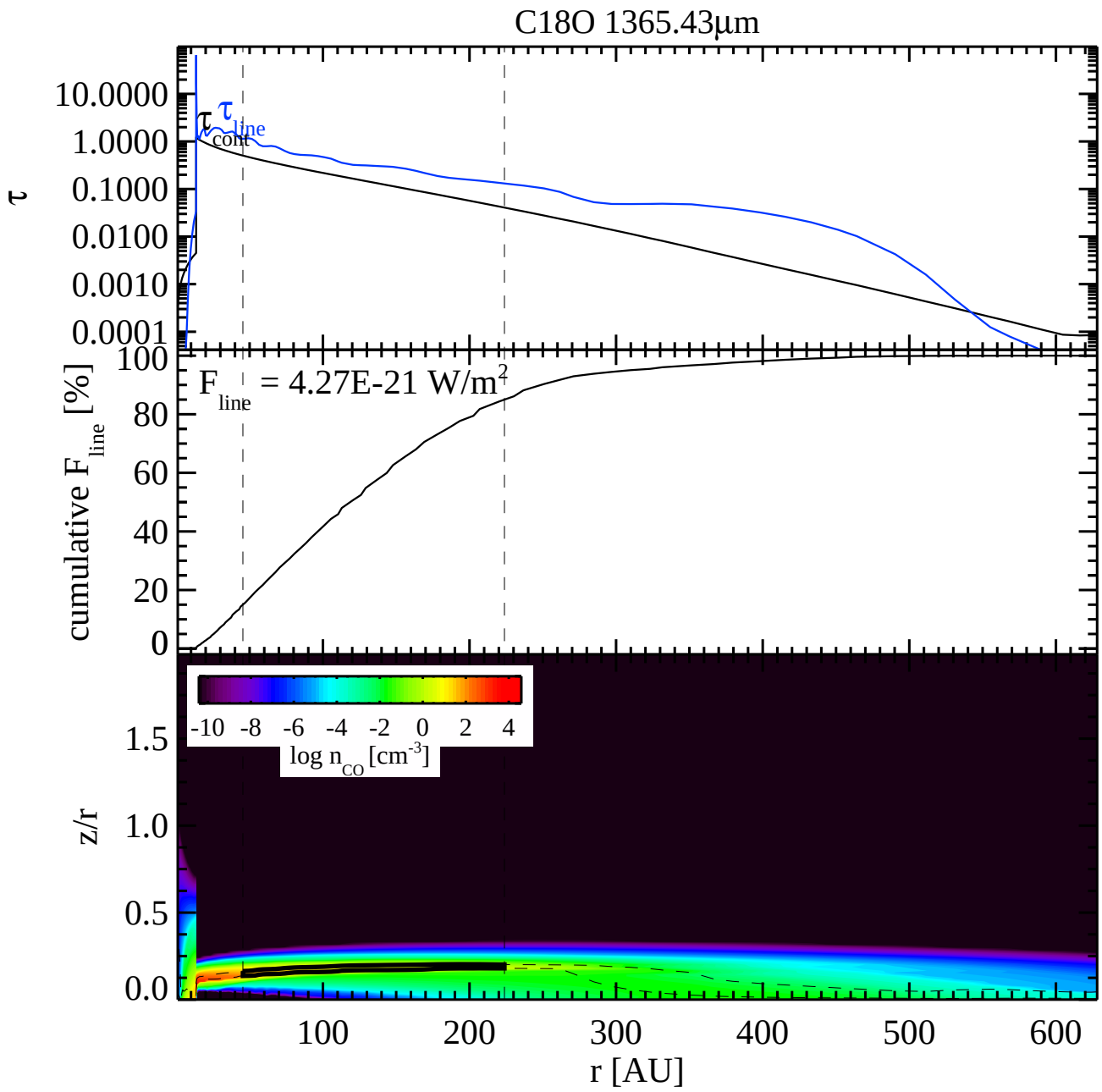

-4
-6
-8
-10
-12
log ε (NH3#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

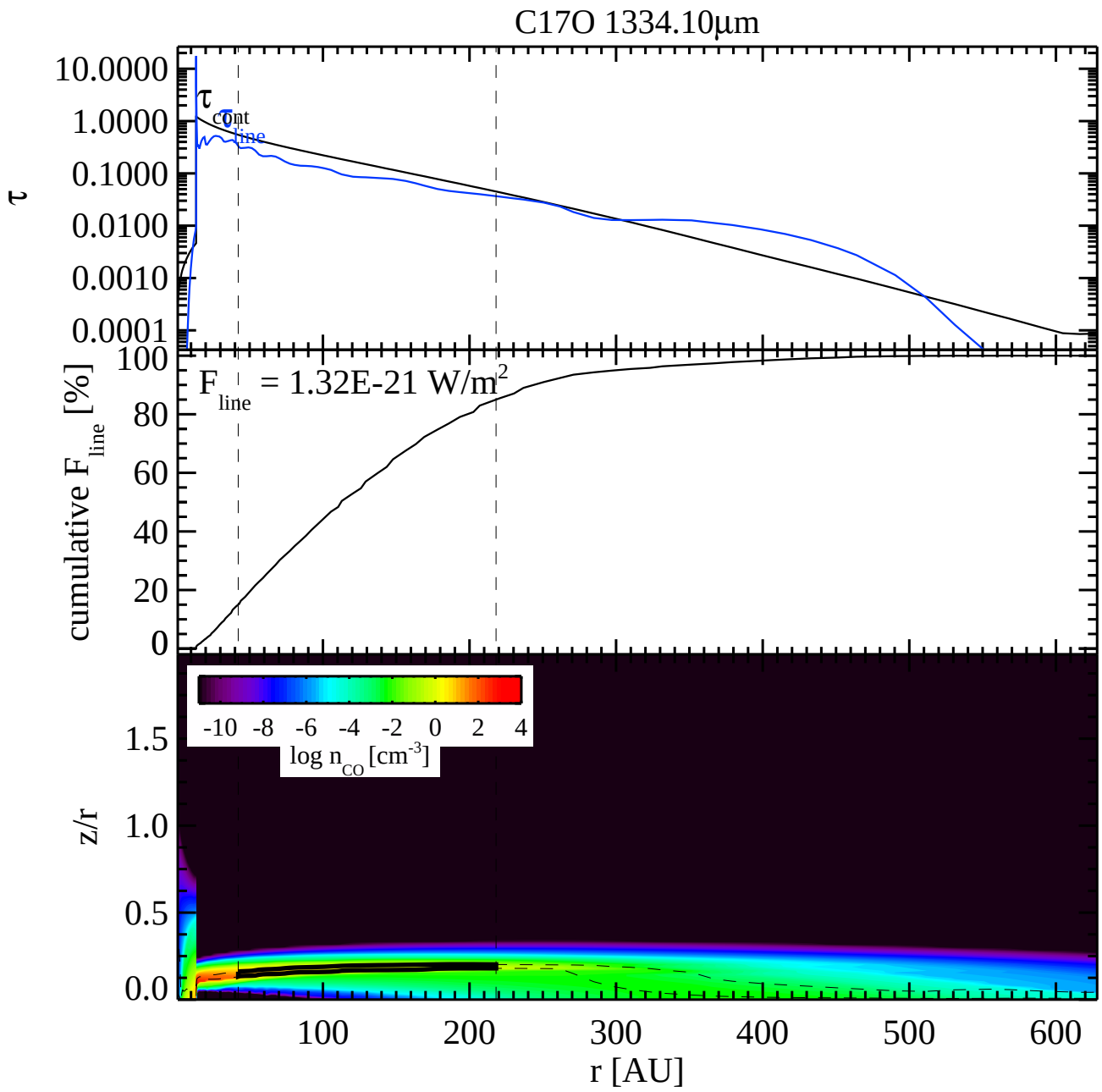

-4
-6
-8
-10
-12
log ε (N2#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

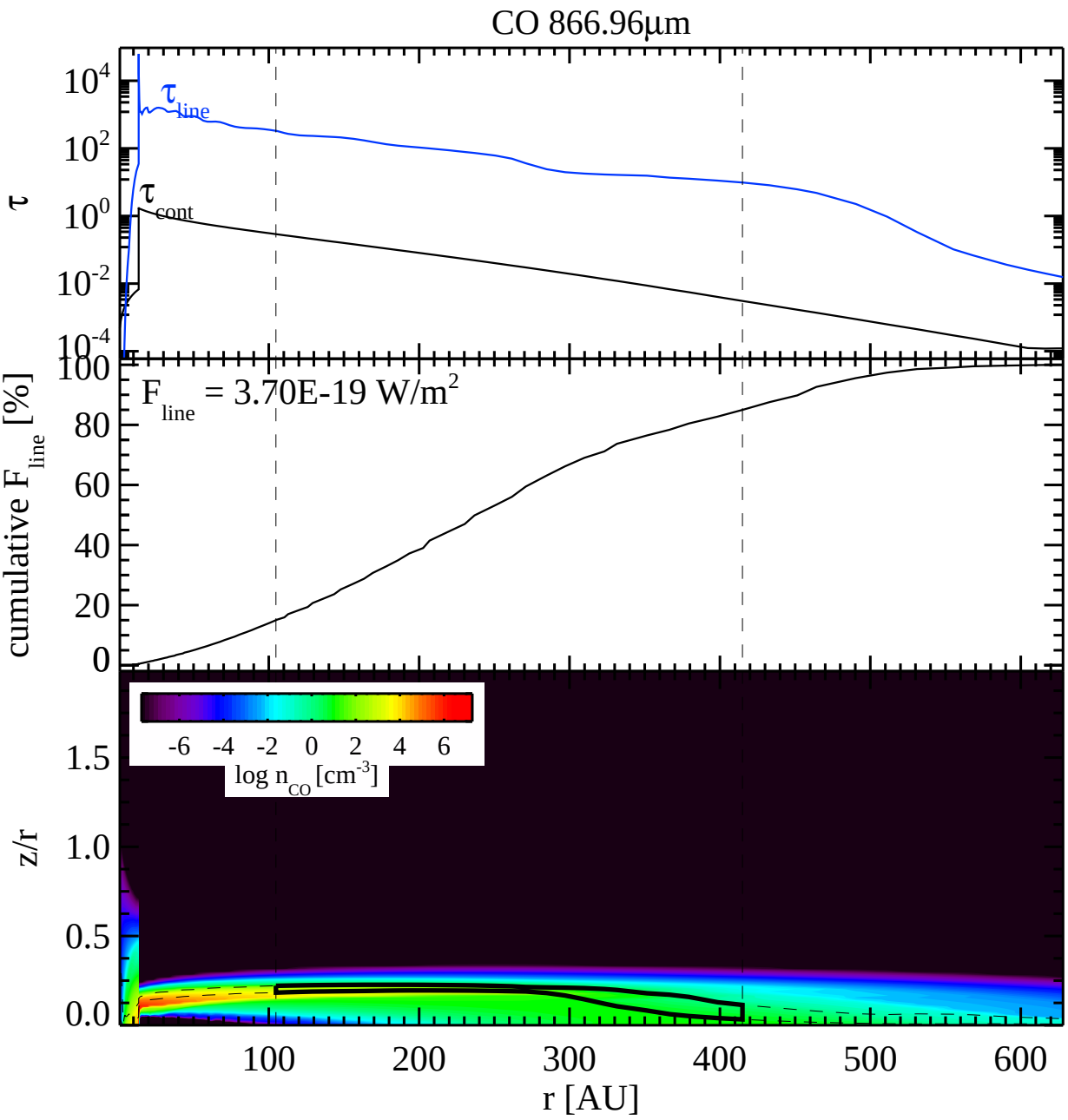

-4
-6
-8
-10
-12
log ε (CH3OH#)
0.8
0.6
0.4
0.2
0.0
z / r
1
10
100
r [AU]

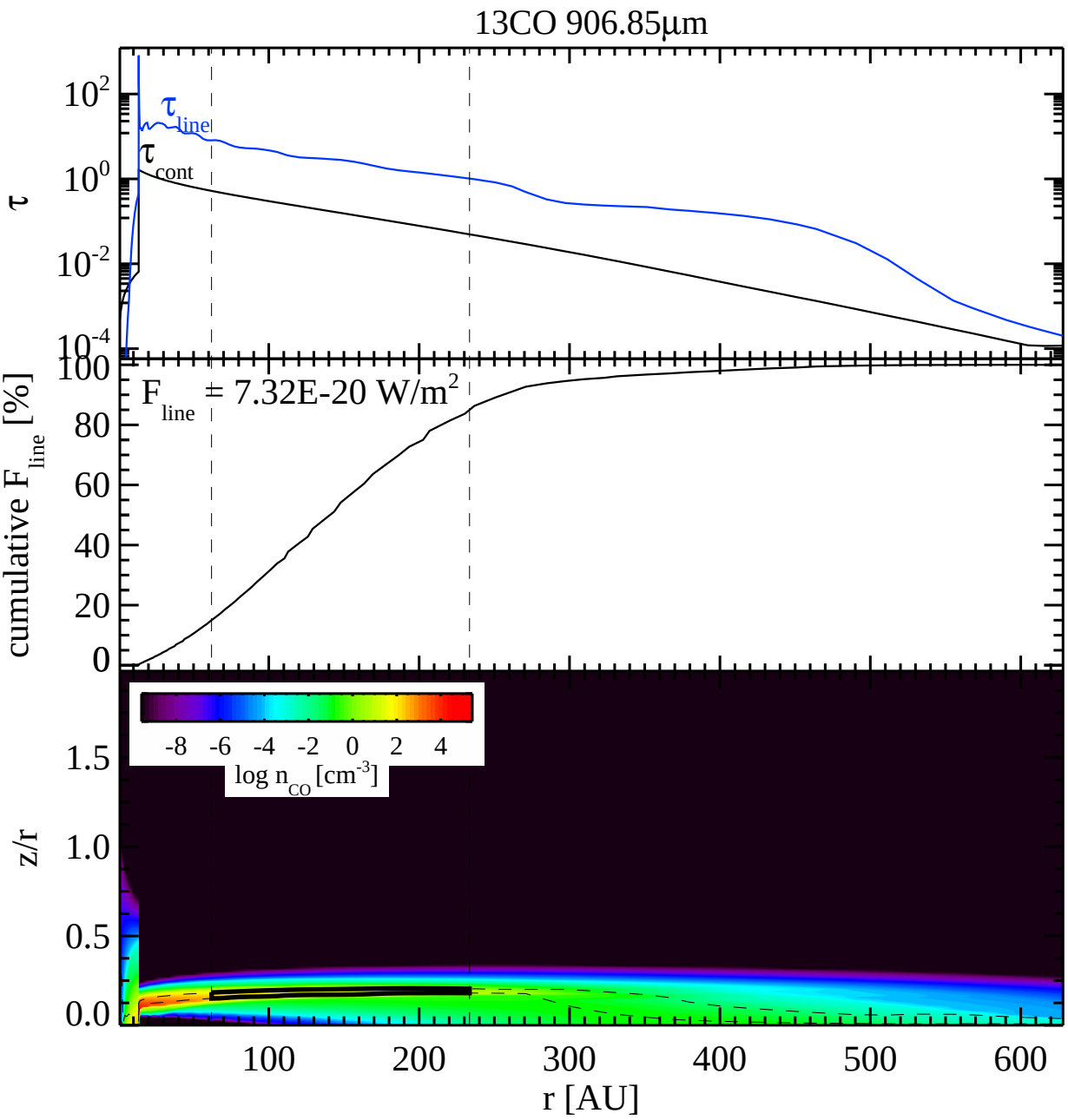

CO 1300.40μm
τ
10^4
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.17E-19 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

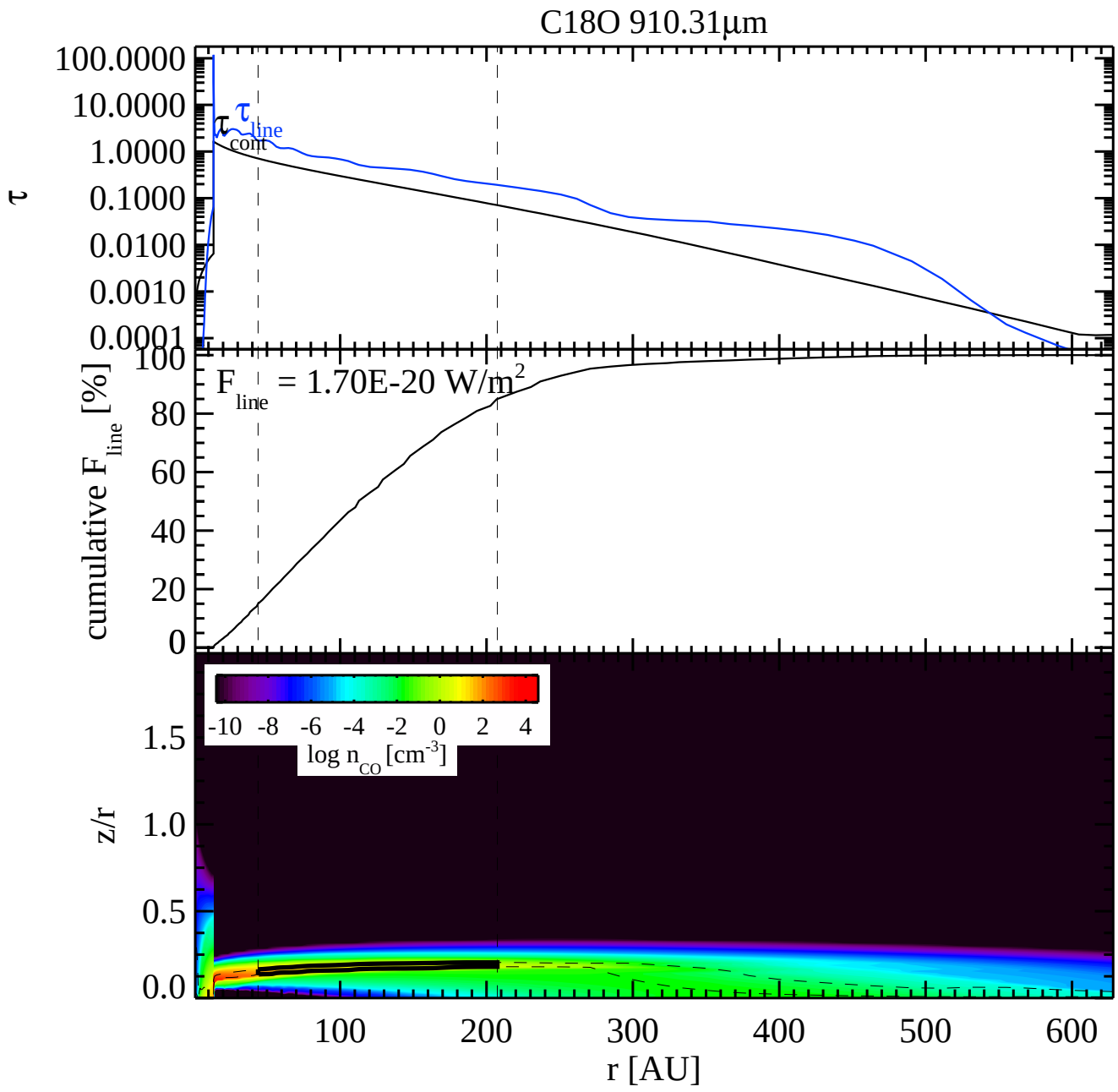

13CO 1360.23µm
τ
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.06E-20 W/m^2
-8 -6 -4 -2 0 2 4
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

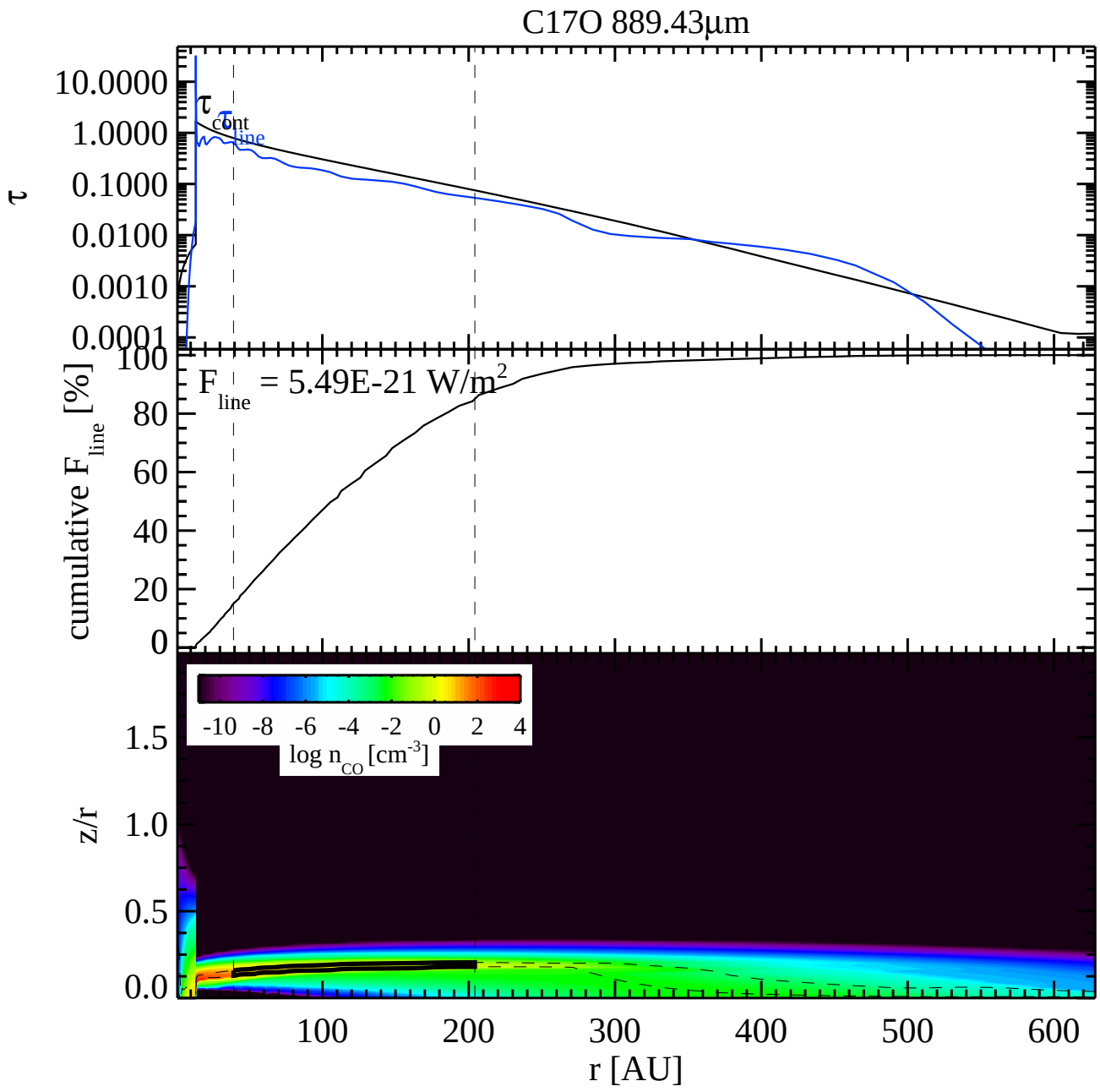

C18O 1365.43µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ line
τ cont
cumulative F line [%]
100
80
60
40
20
0
F line = 4.27E-21 W/m2
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

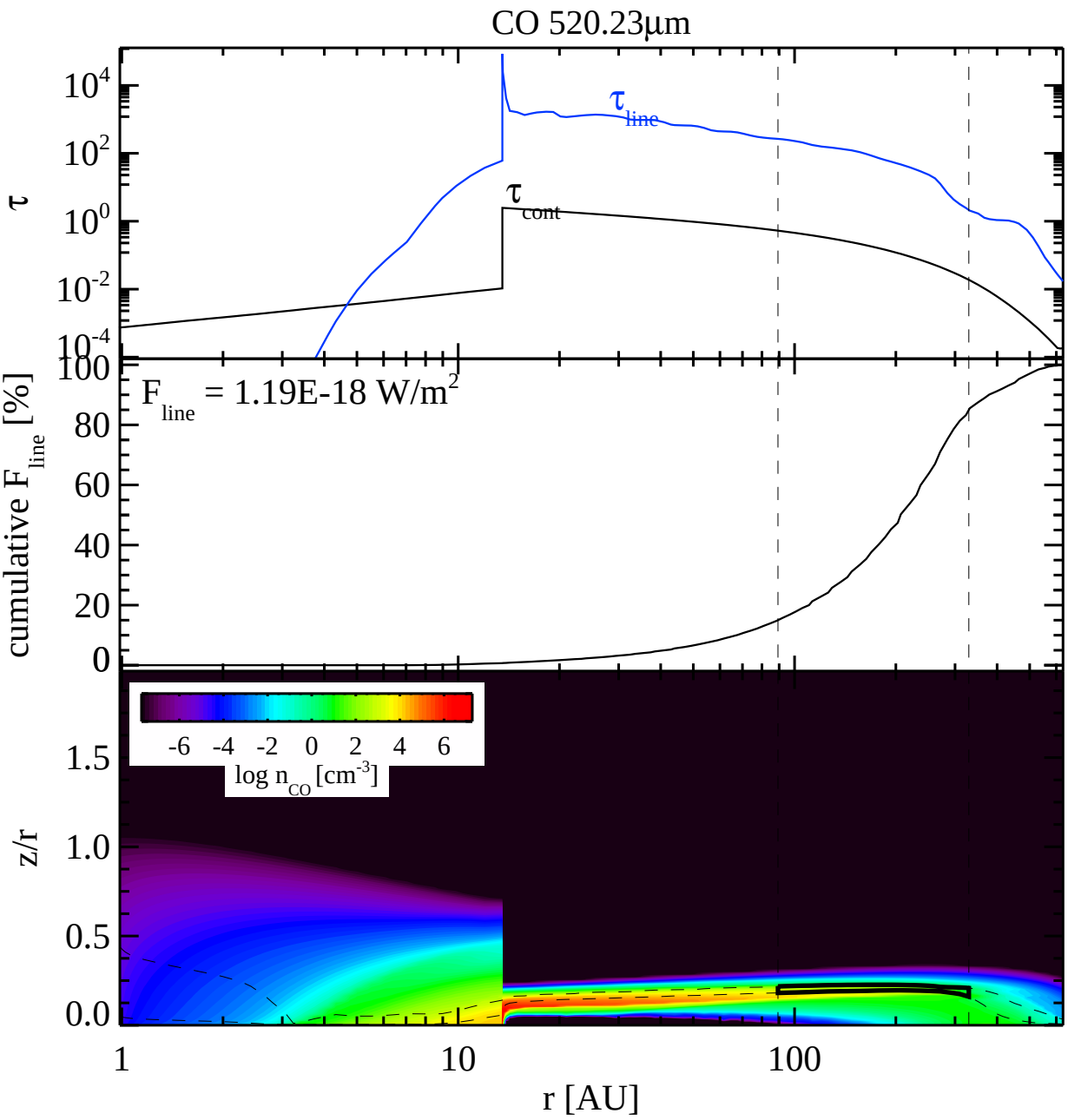

C17O 1334.10µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.32E-21 W/m2
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

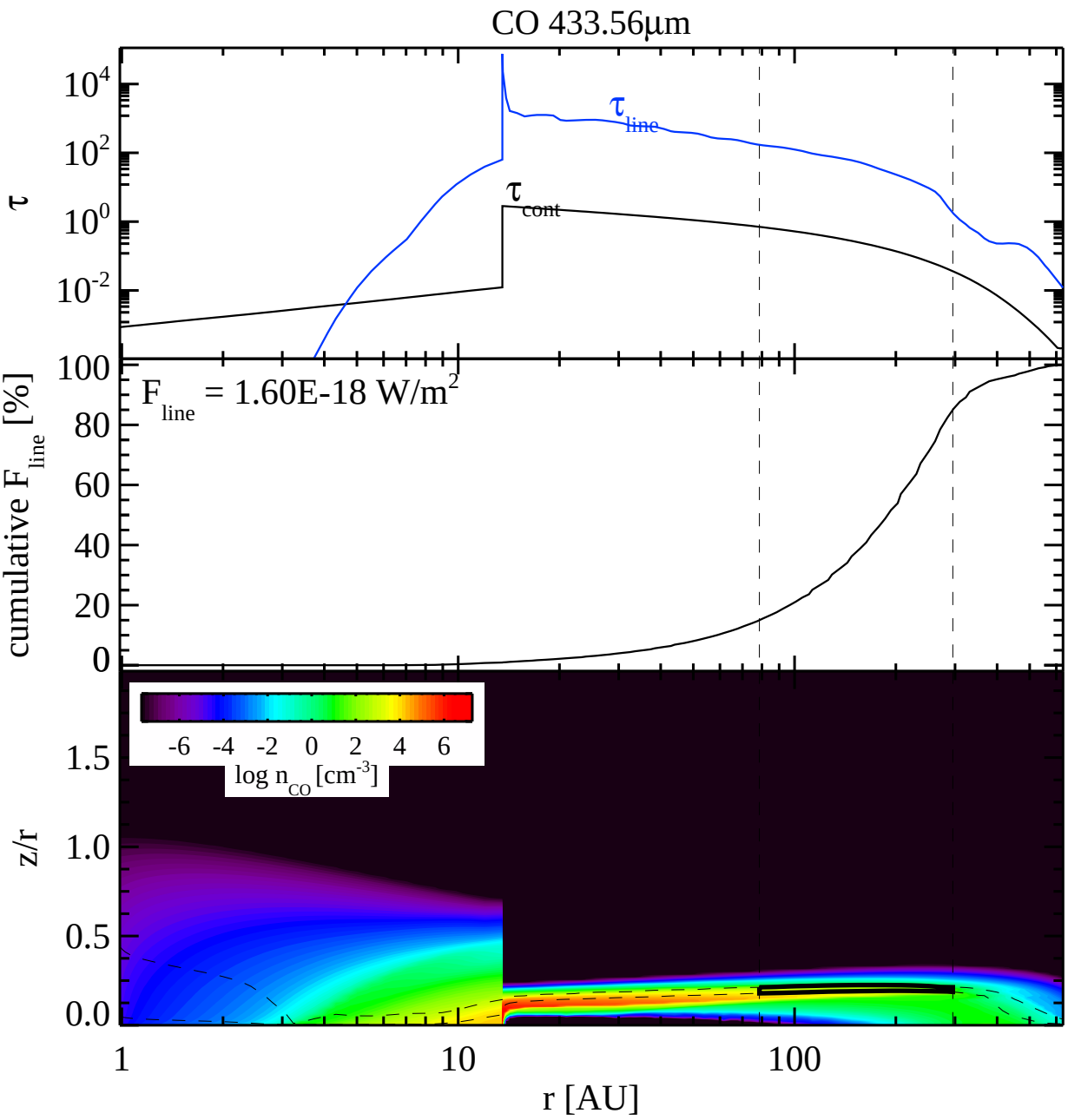

CO 866.96µm
τ
10^4
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 3.70E-19 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

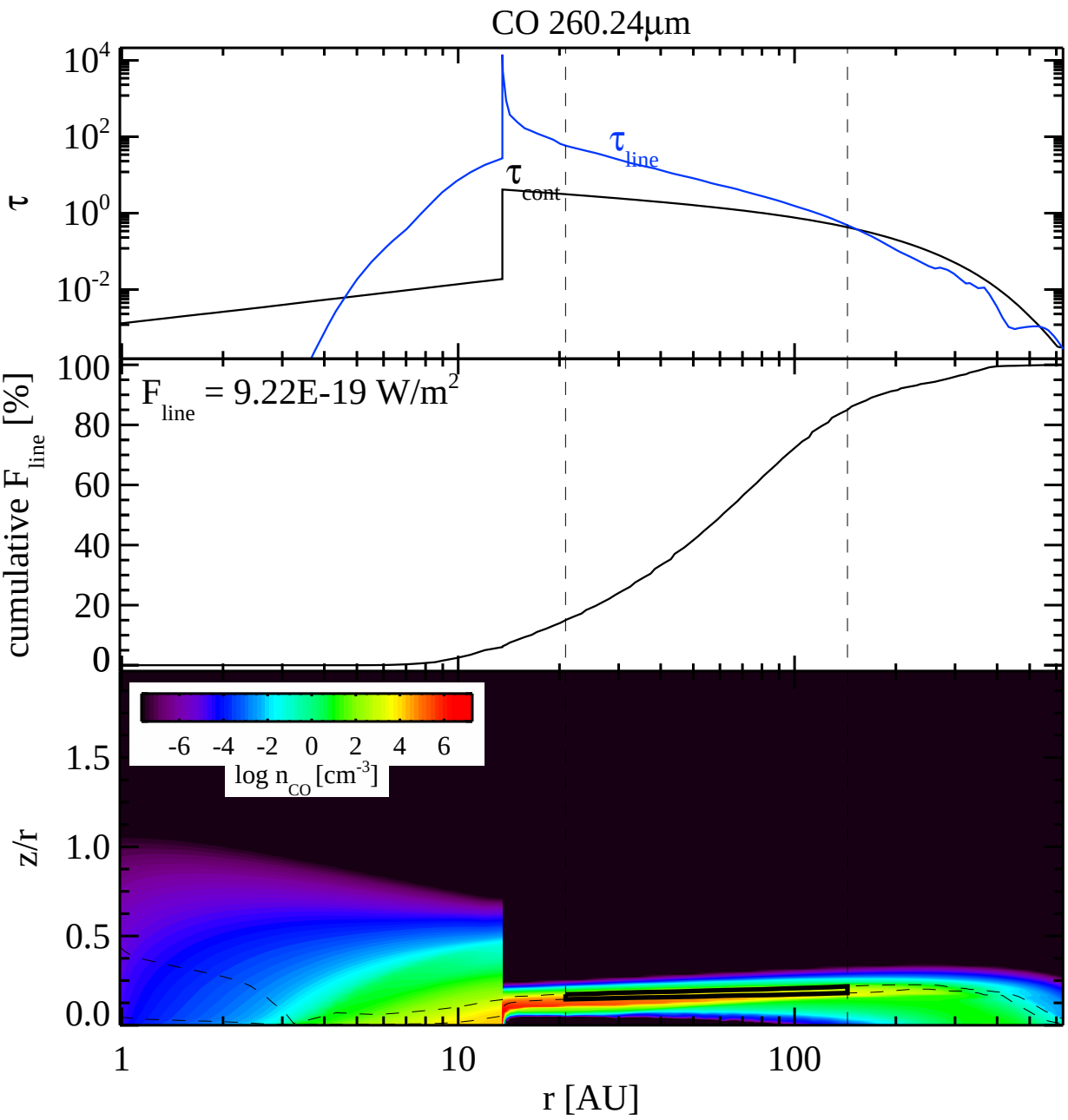

13CO 906.85µm
τ
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 7.32E-20 W/m^2
-8 -6 -4 -2 0 2 4
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

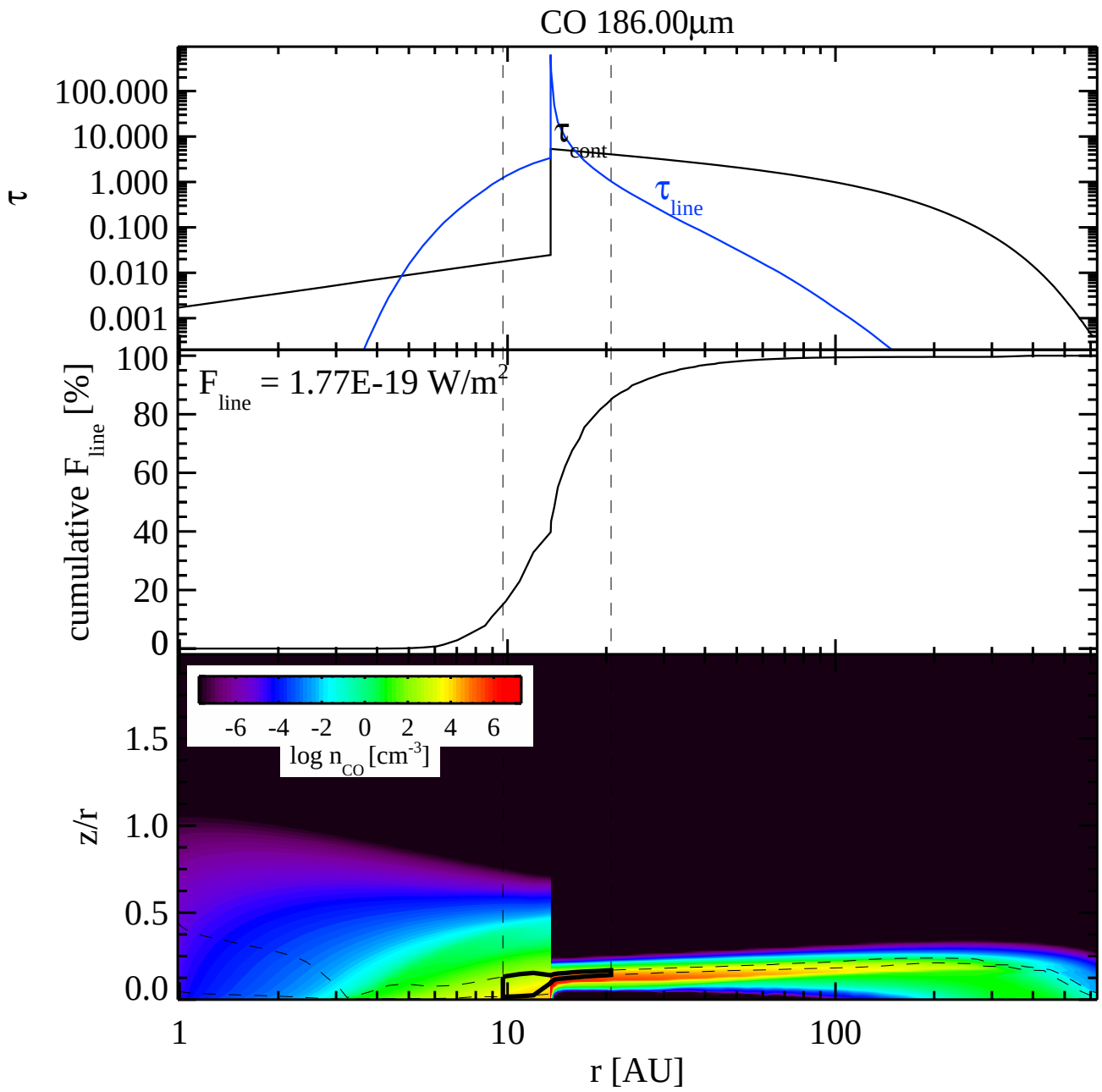

C18O 910.31µm
τ
100.0000
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ line
τ cont
cumulative F line [%]
100
80
60
40
20
0
F line = 1.70E-20 W/m2
z/r
1.5
1.0
0.5
0.0
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
100
200
300
400
500
600
r [AU]

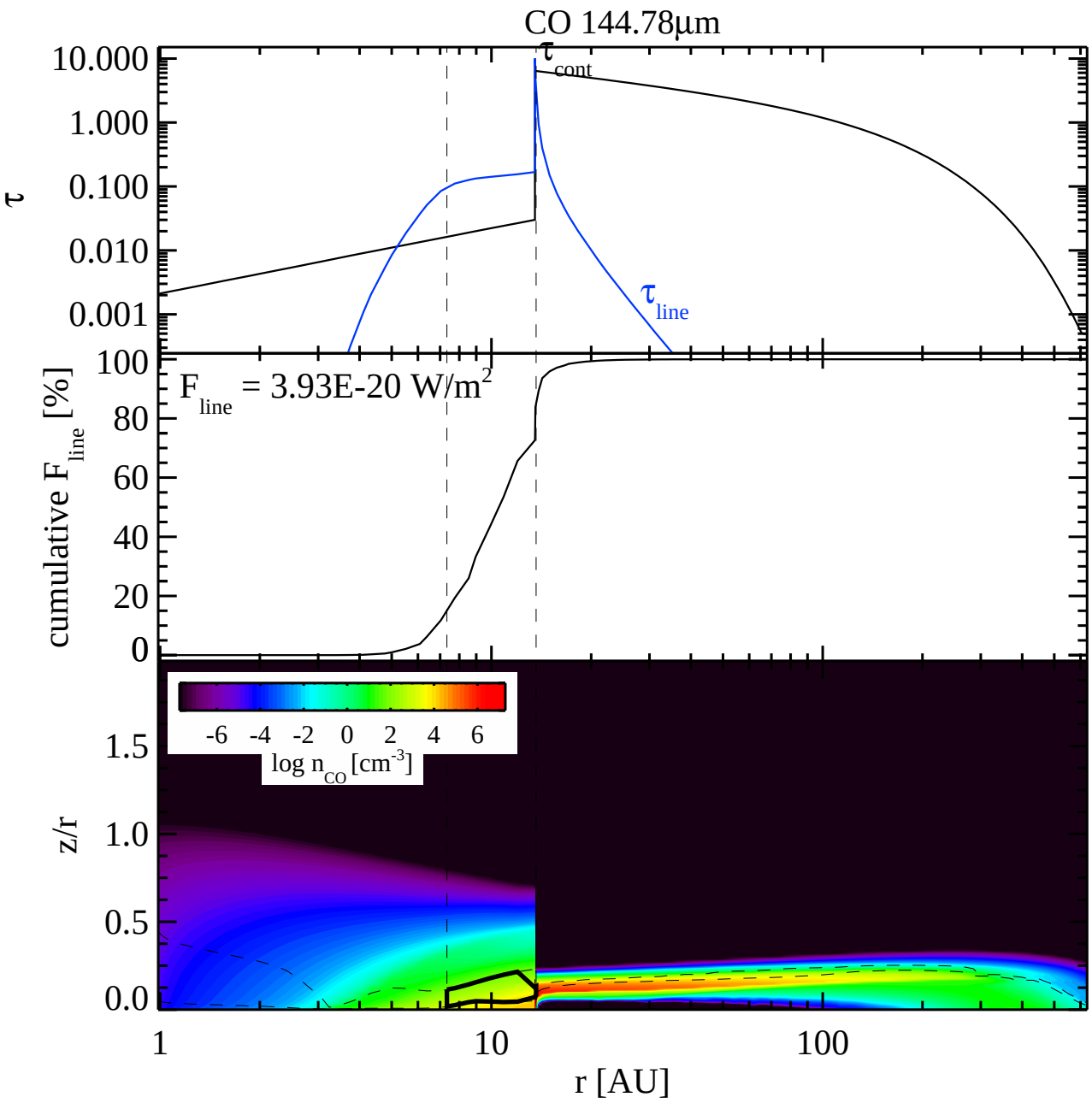

C17O 889.43µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 5.49E-21 W/m2
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

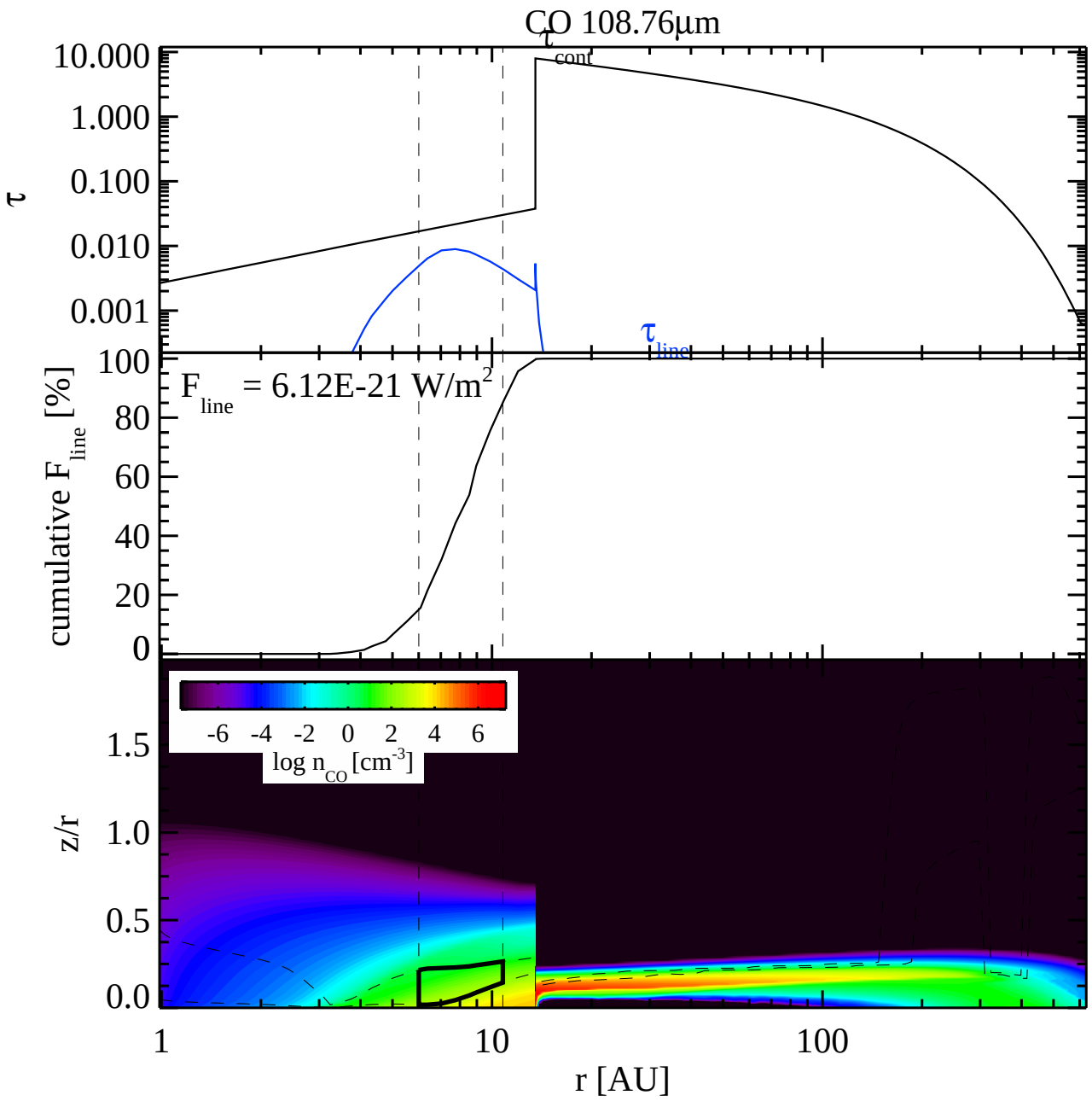

CO 520.23µm
τ
10^4
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.19E-18 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

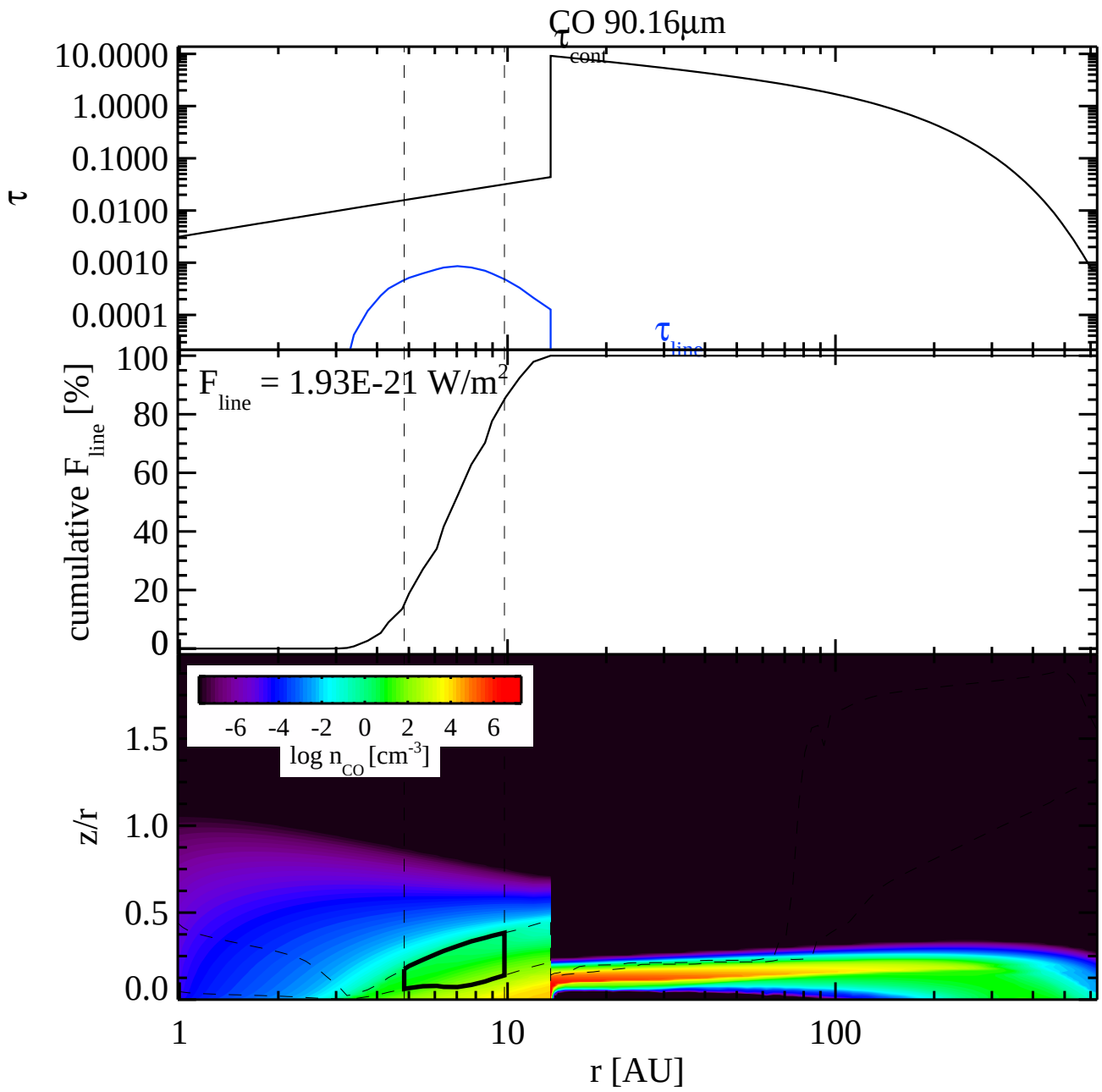

CO 433.56µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.60E-18 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

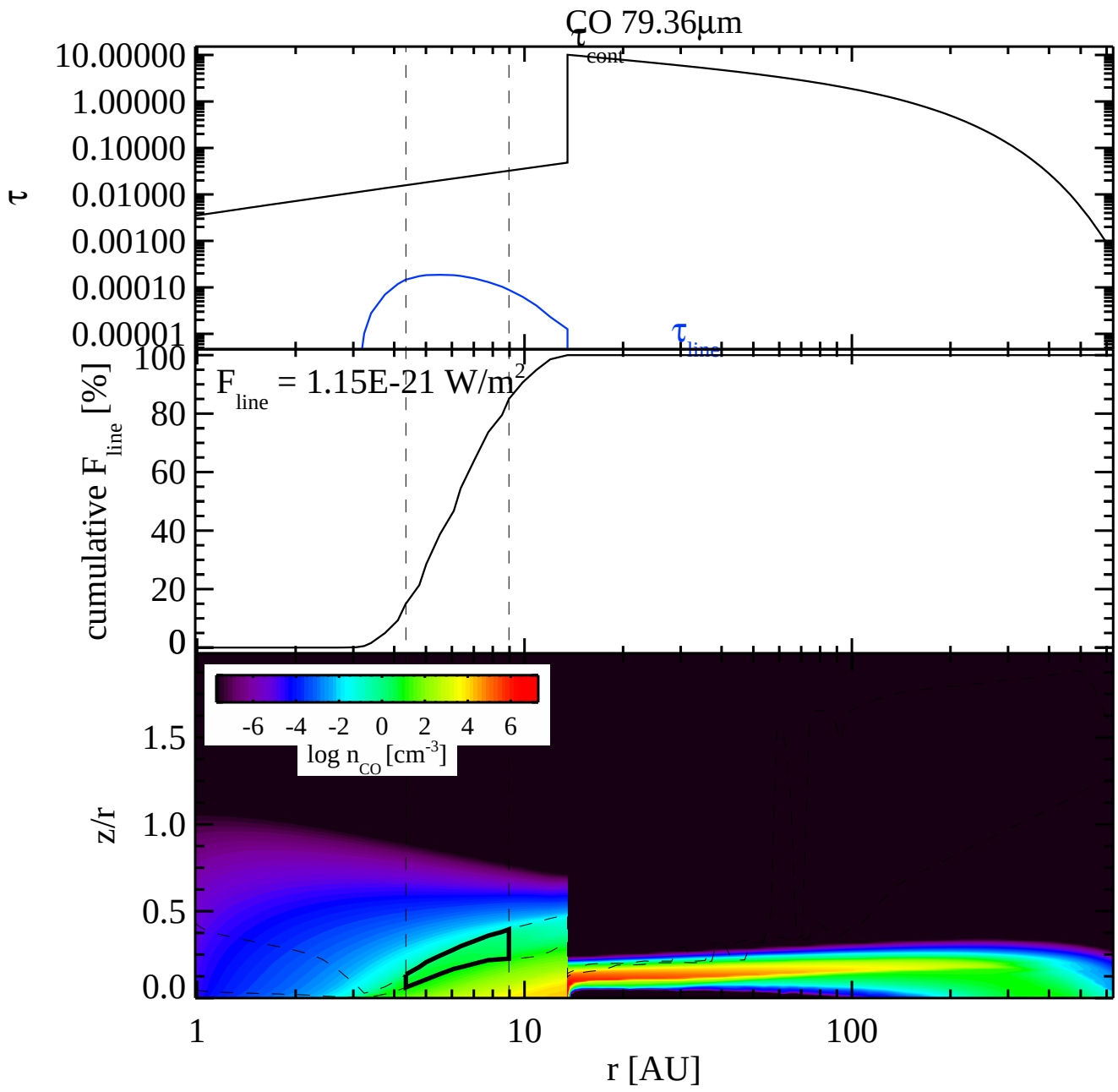

CO 260.24μm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 9.22E-19 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

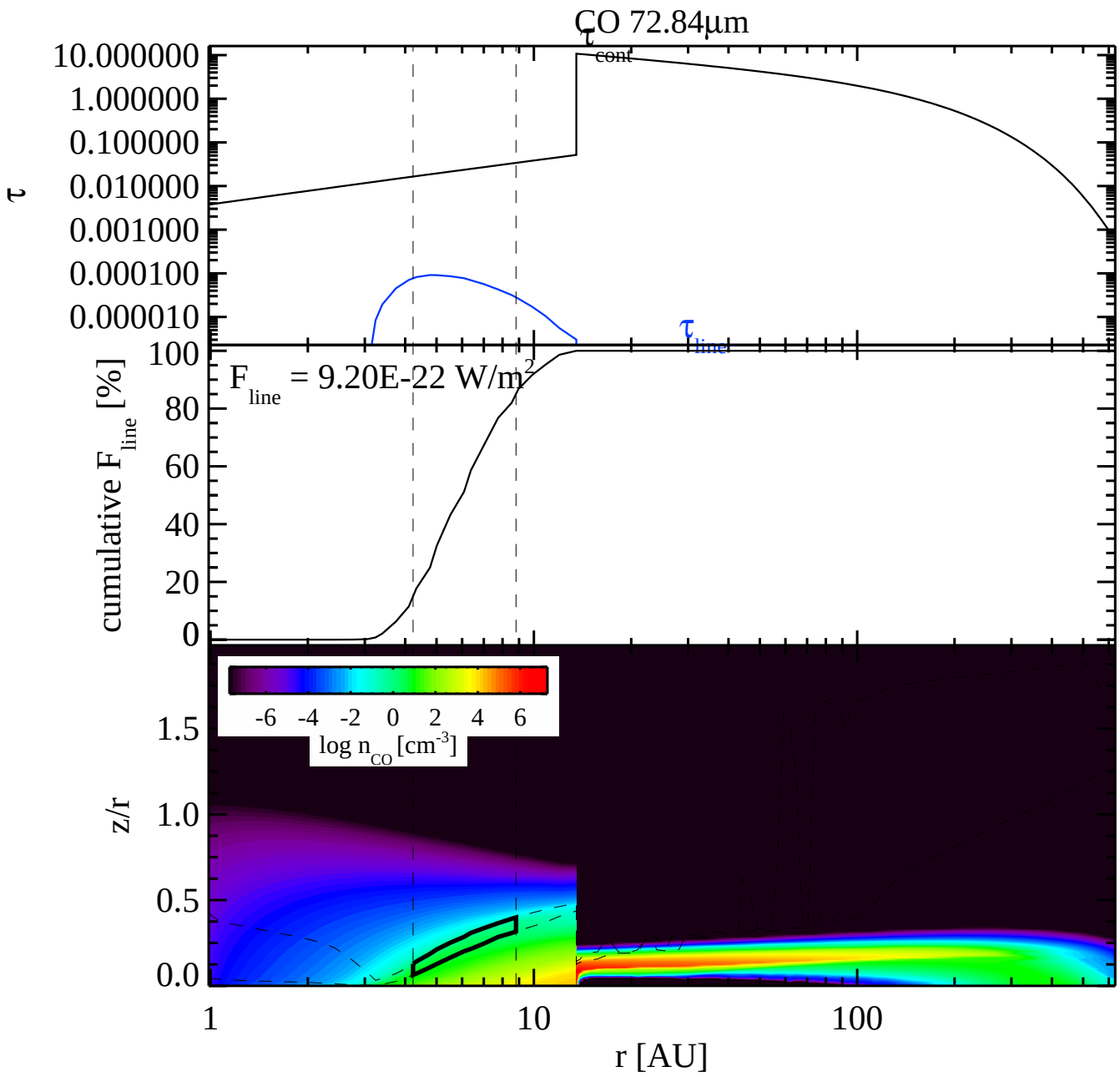

CO 186.00µm
τ
100.000
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.77E-19 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

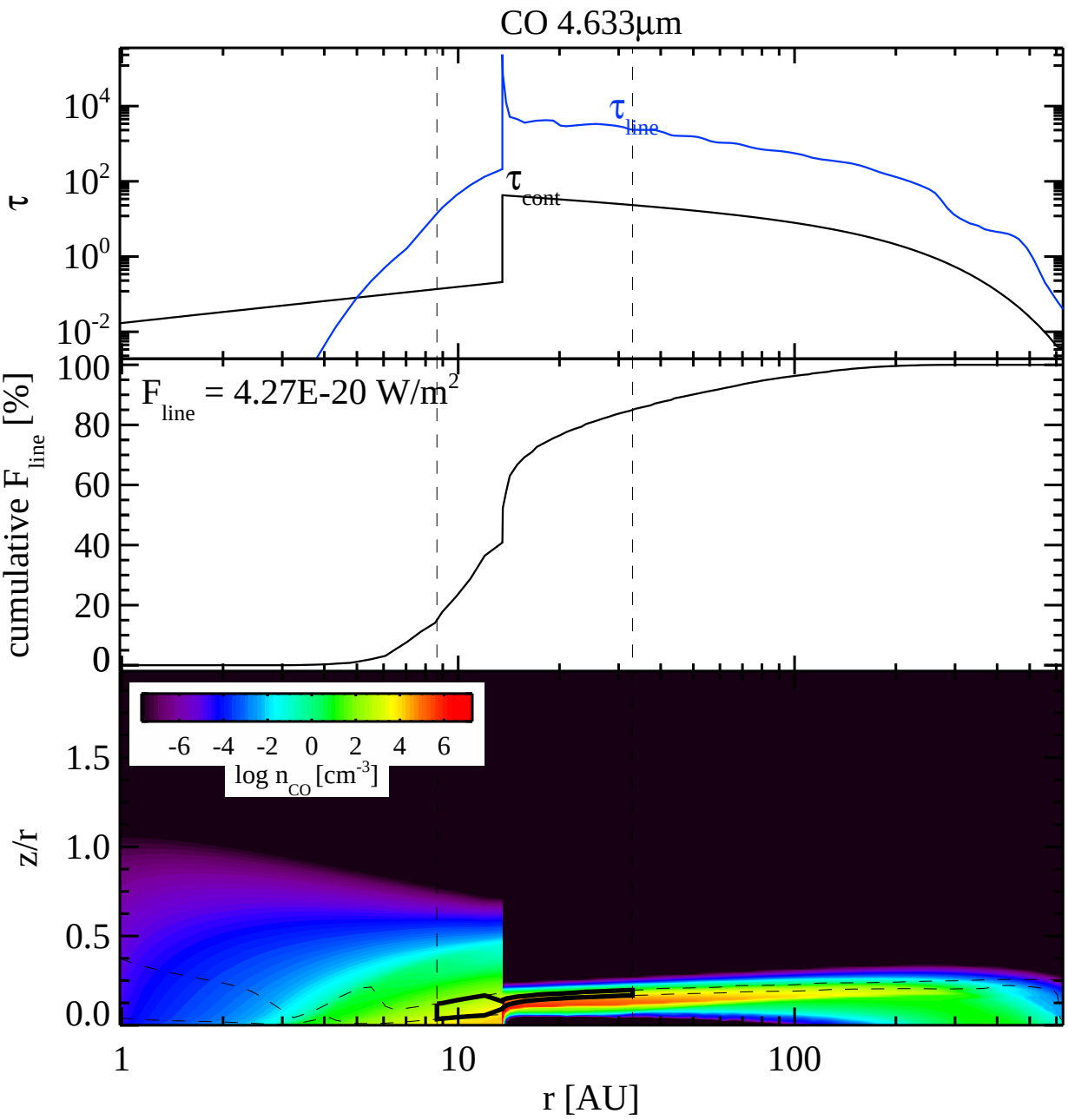

CO 144.78µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.93E-20 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

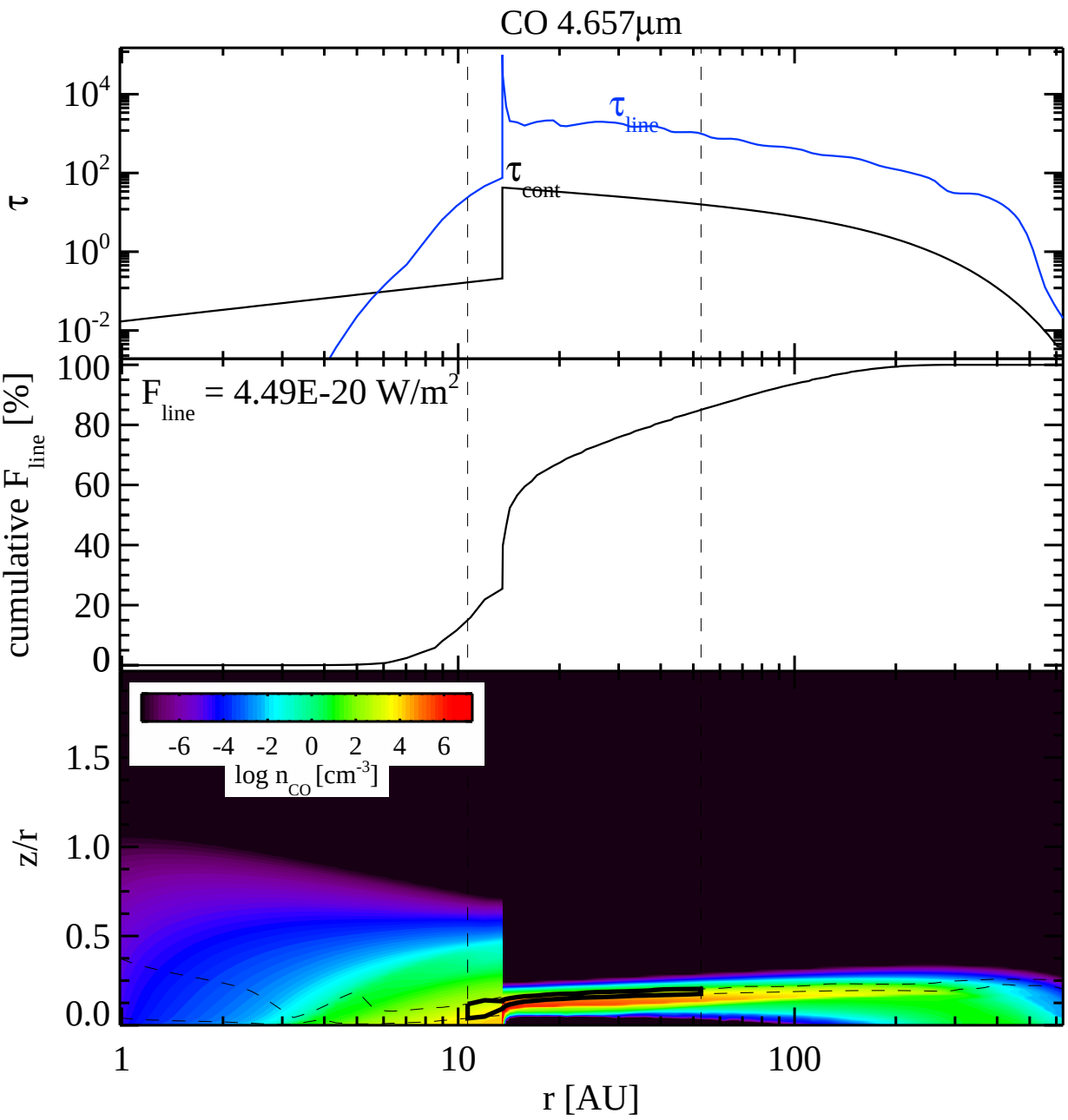

CO 108.76µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 6.12E-21 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

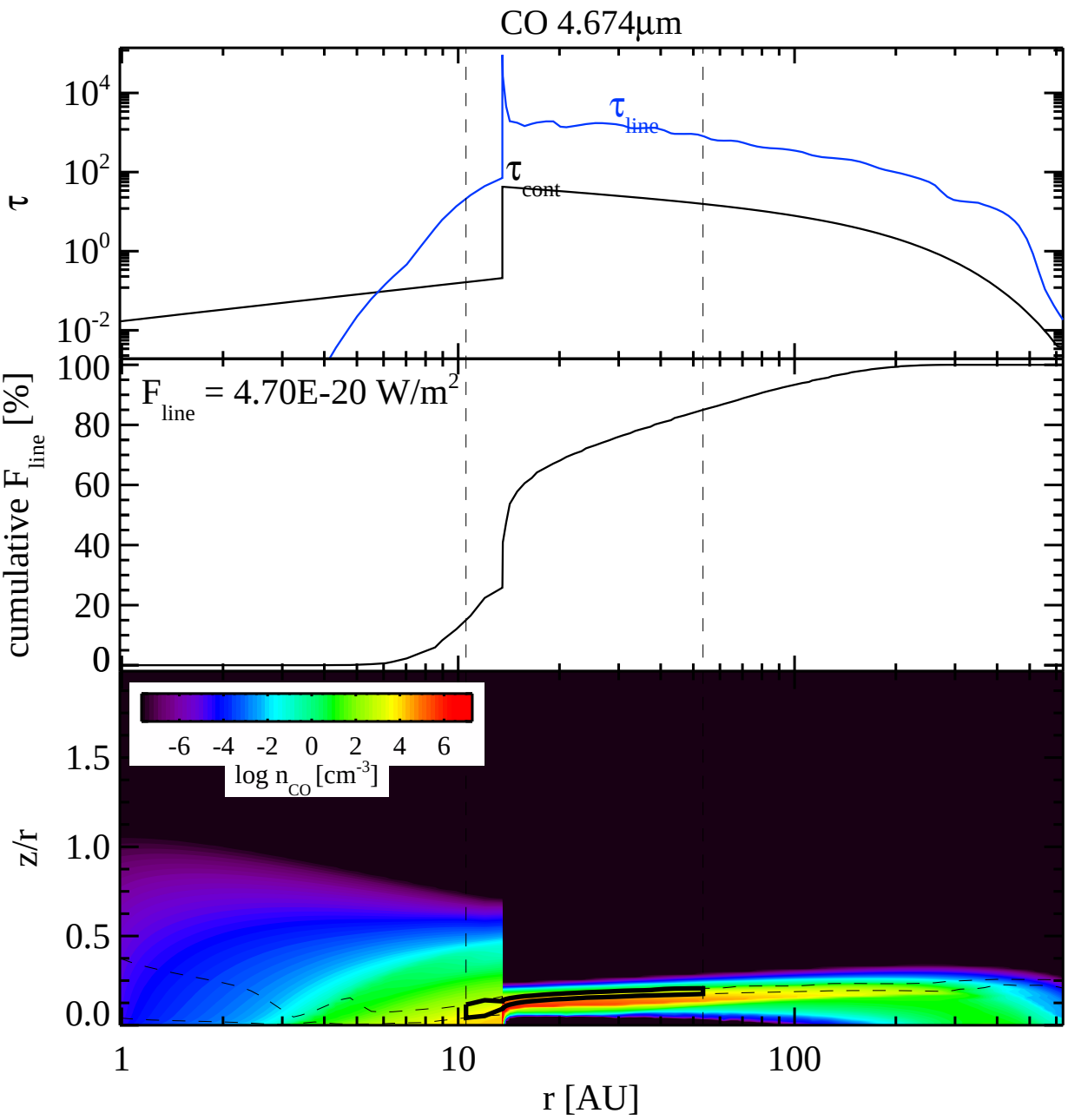

CO 90.16µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.93E-21 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

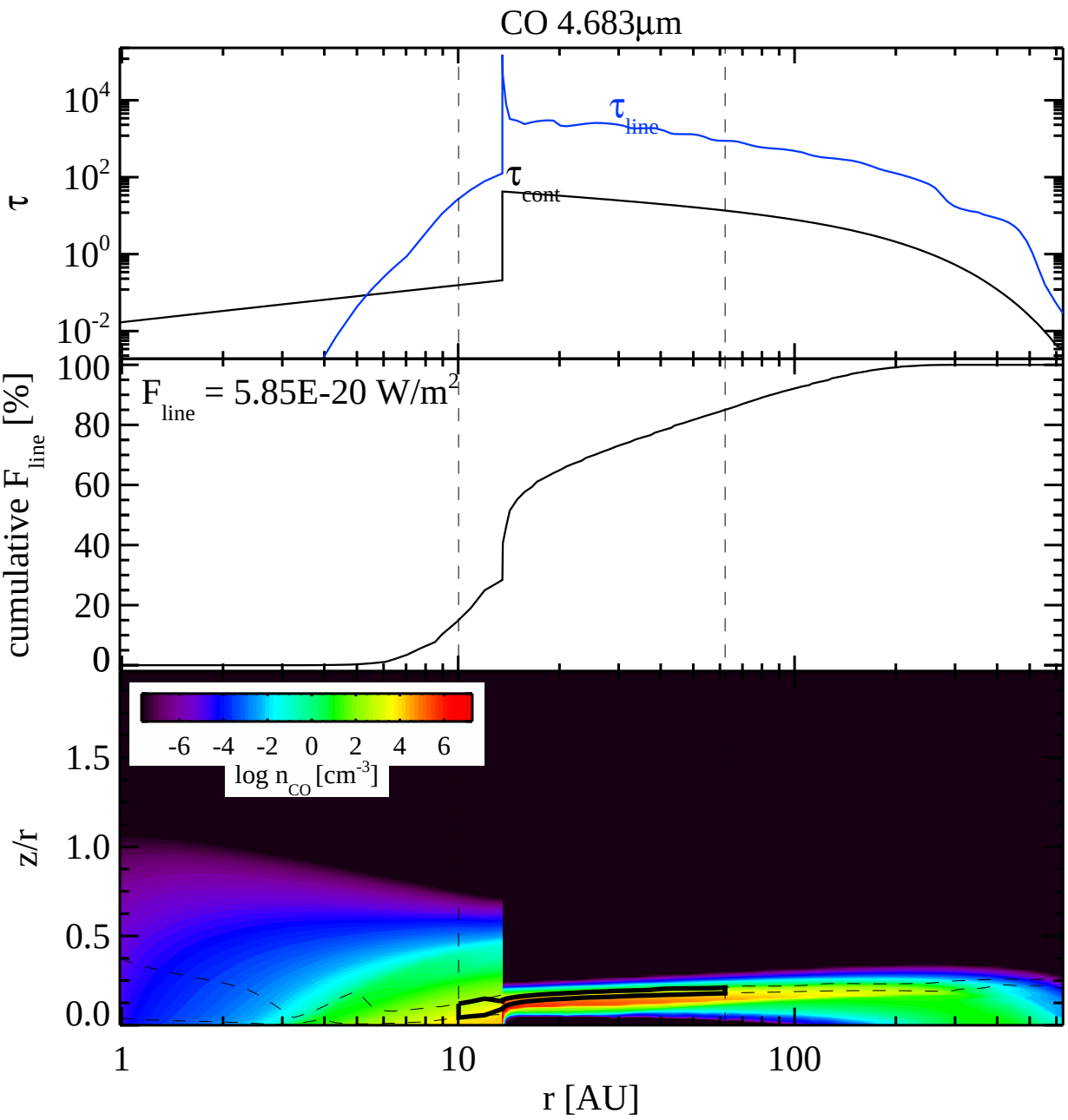

CO 79.36µm
τ
10.00000
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
τ cont
τ line
cumulative F line [%]
F line = 1.15E-21 W/m2
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

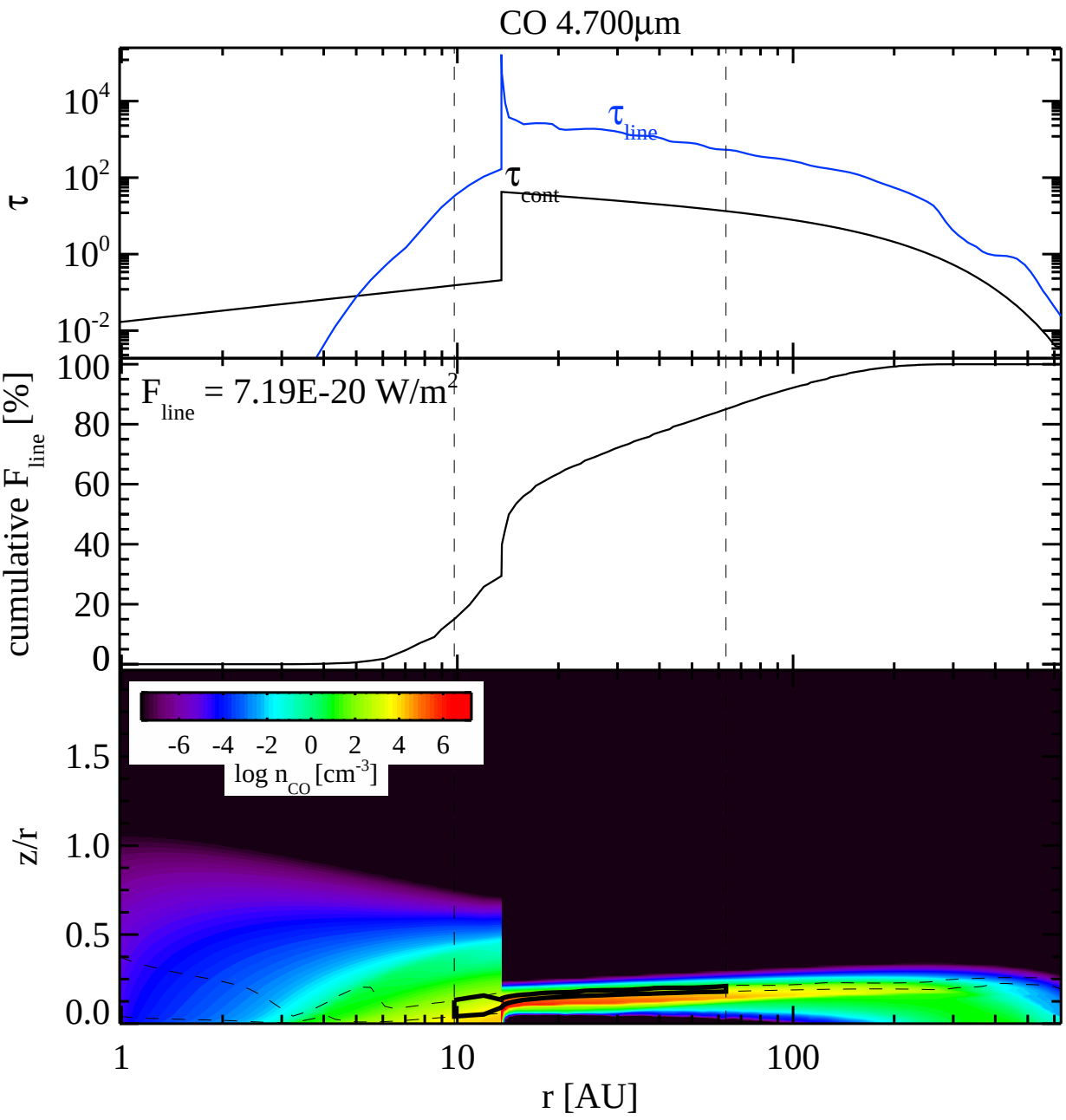

CO 72.84µm
τ
10.000000
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 9.20E-22 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

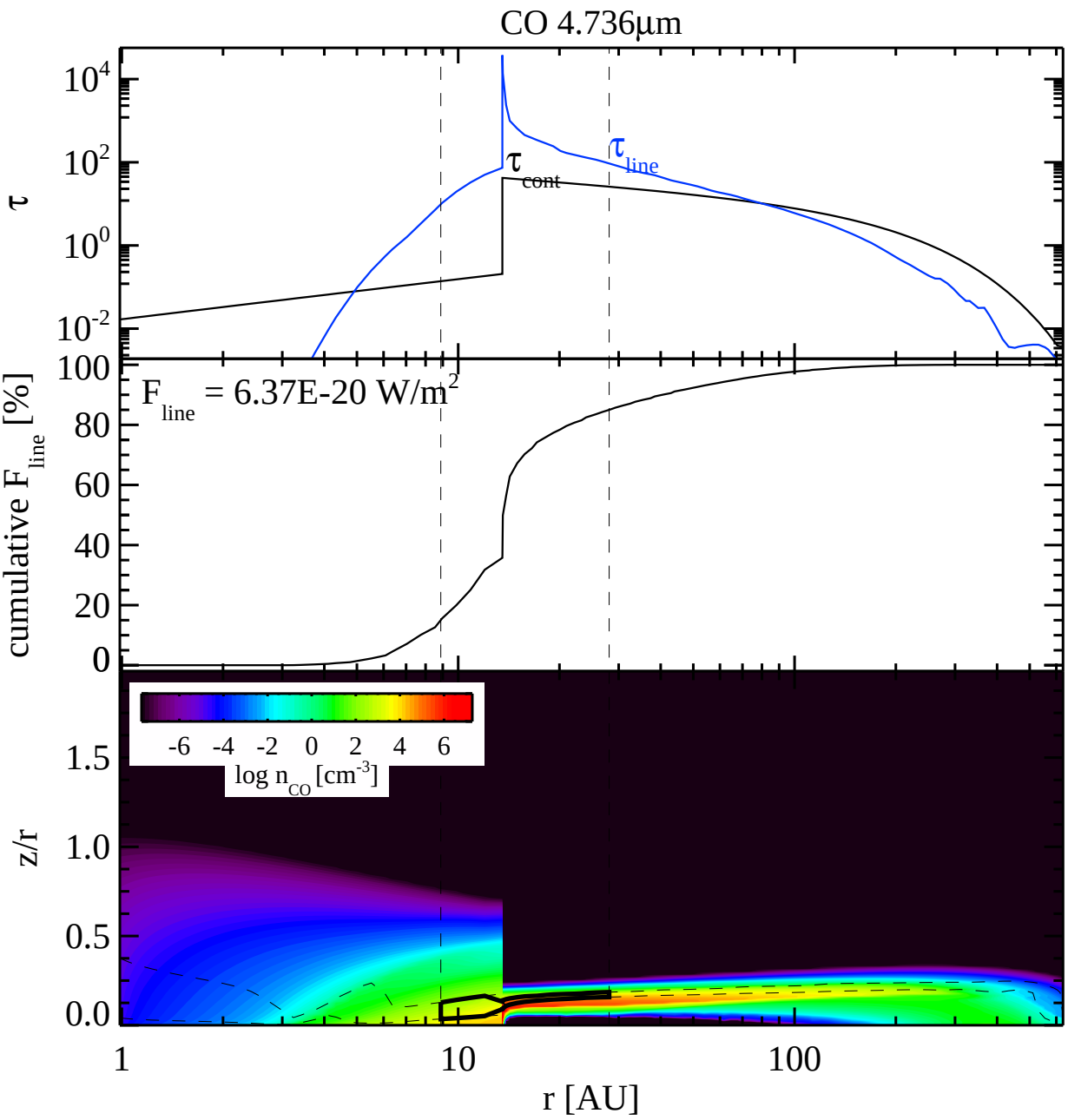

CO 4.633µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 4.27E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

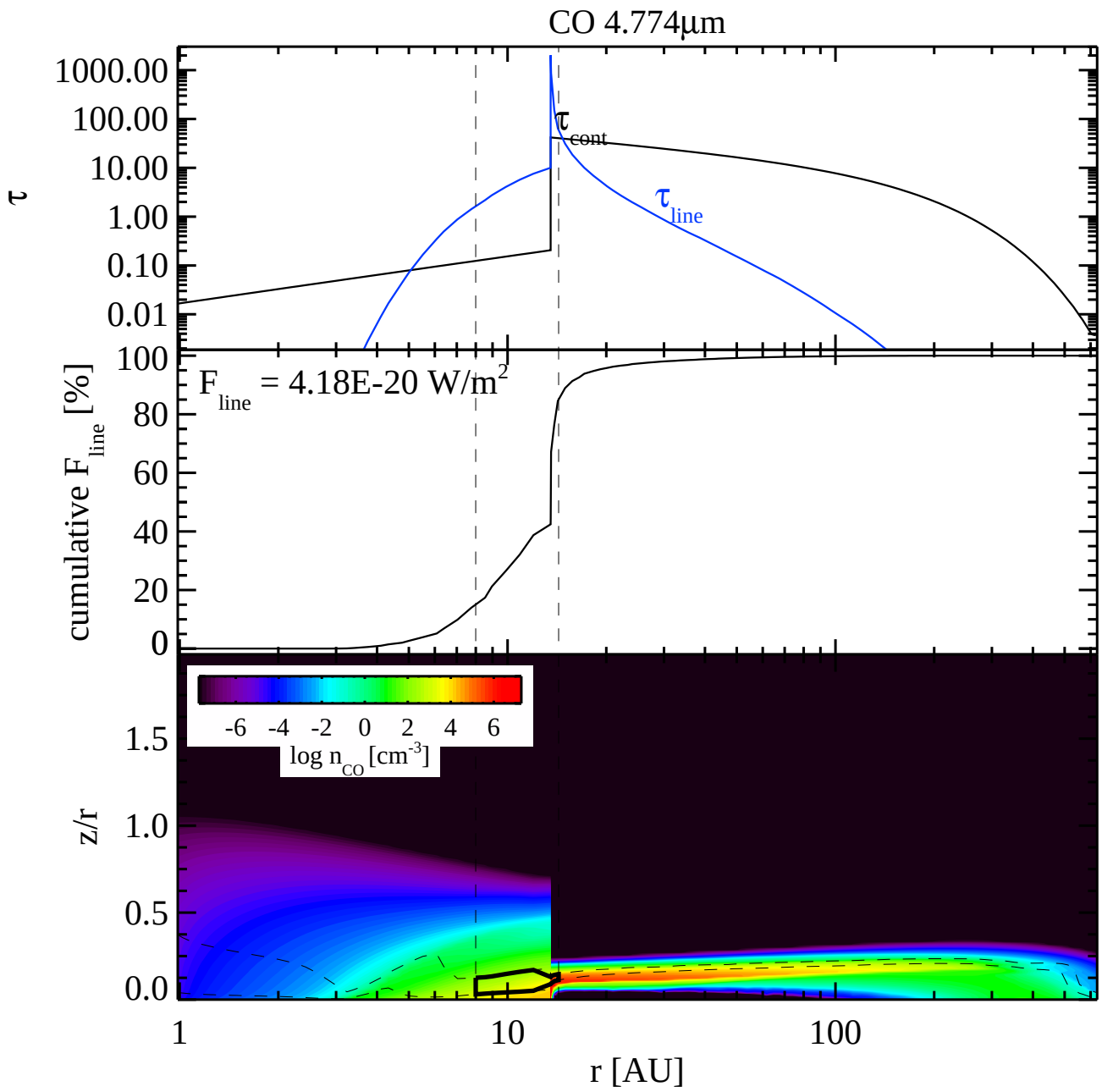

CO 4.657µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 4.49E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

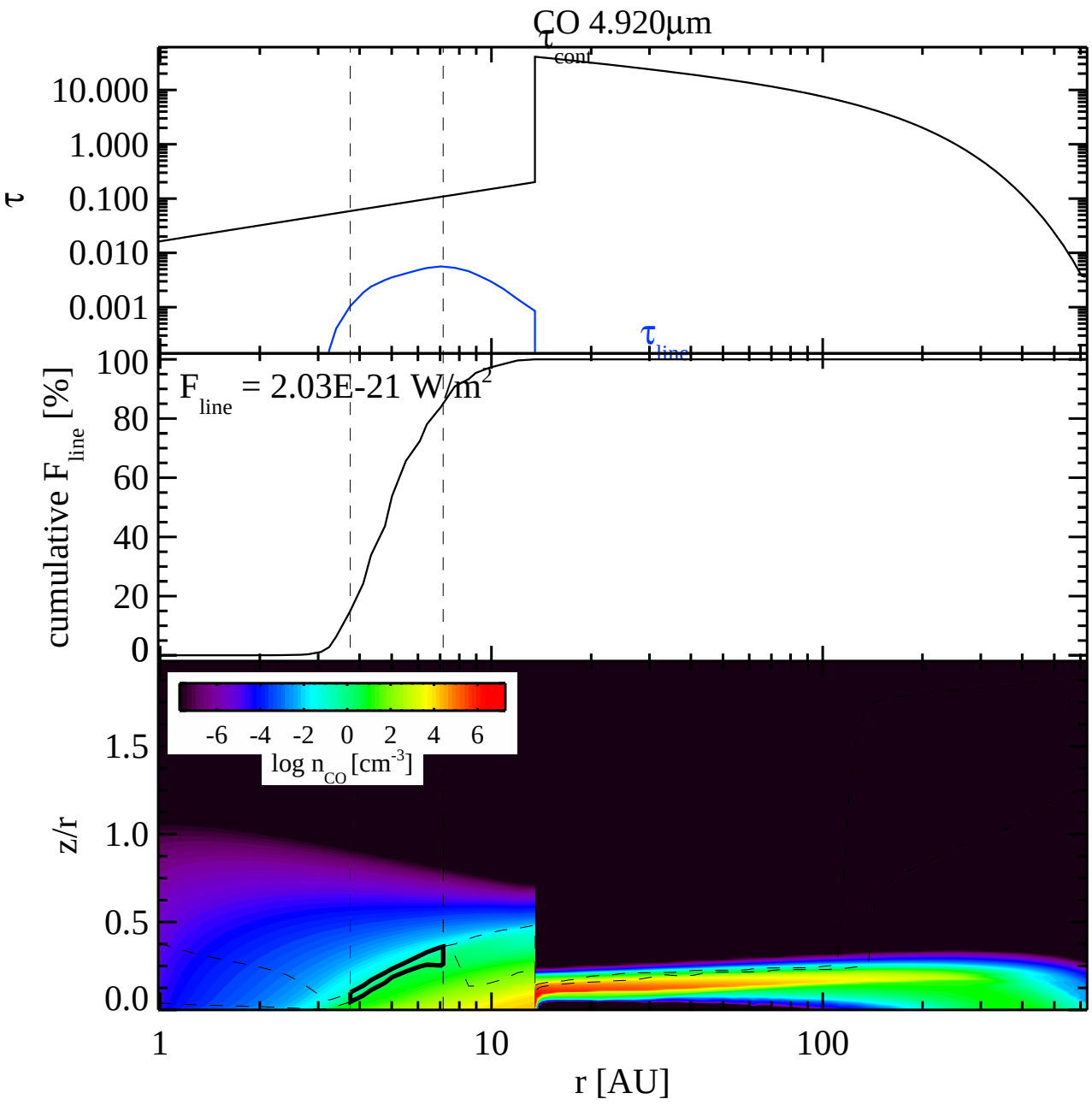

CO 4.674µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 4.70E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

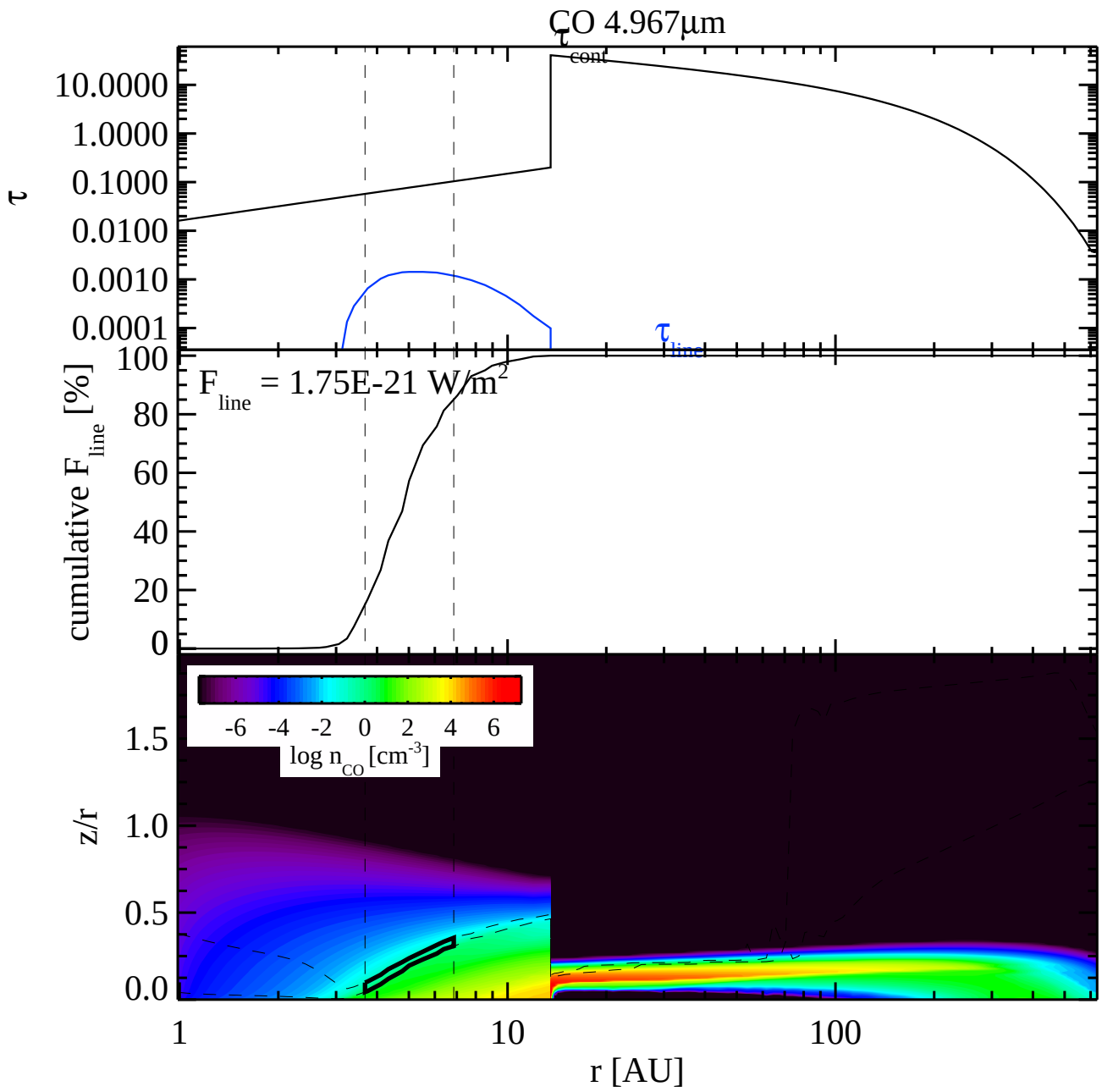

CO 4.683µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 5.85E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

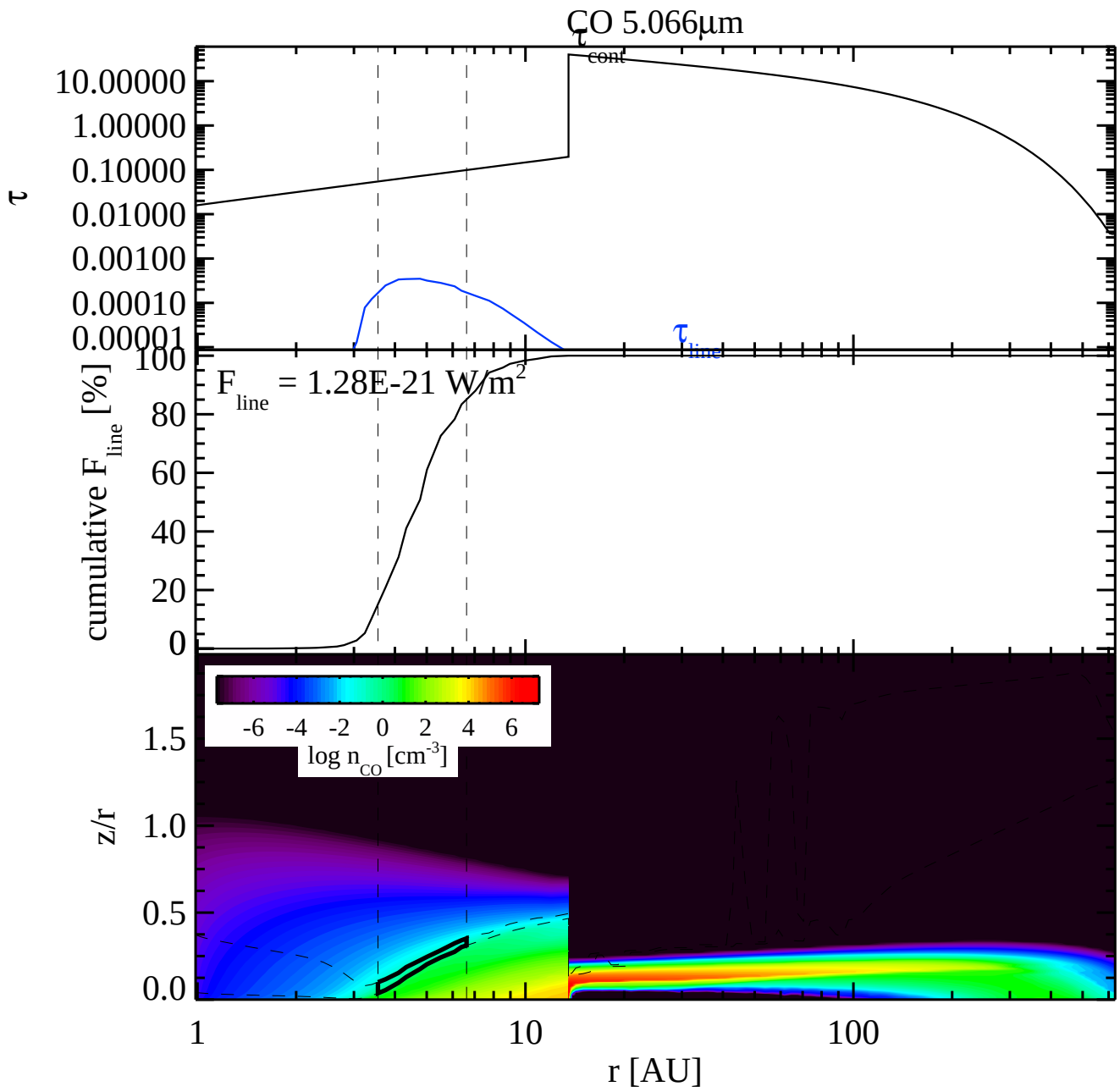

CO 4.700µm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 7.19E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

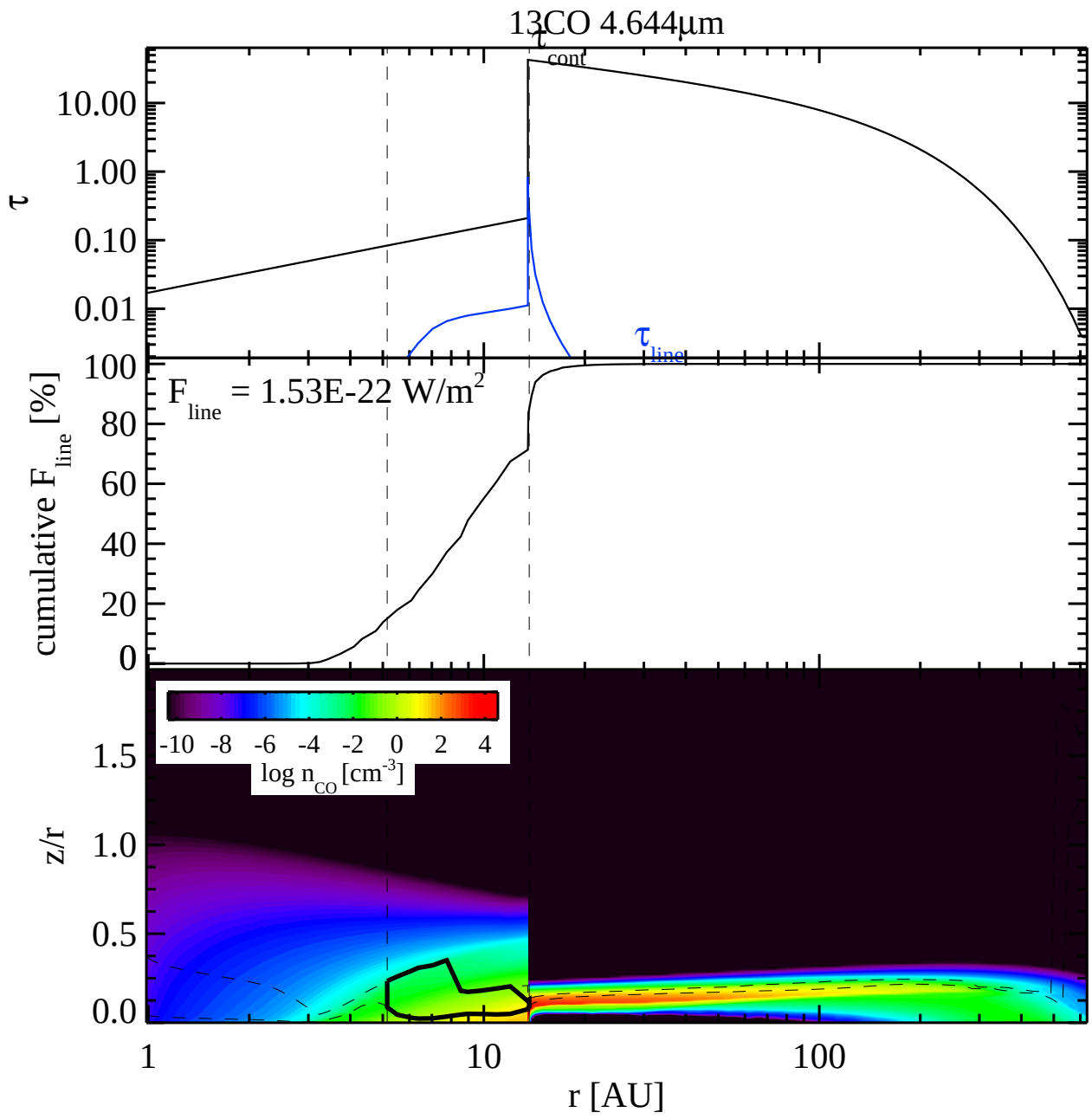

CO 4.736µm
τ
10^4
10^2
10^0
10^{-2}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 6.37E-20 W/m^2
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

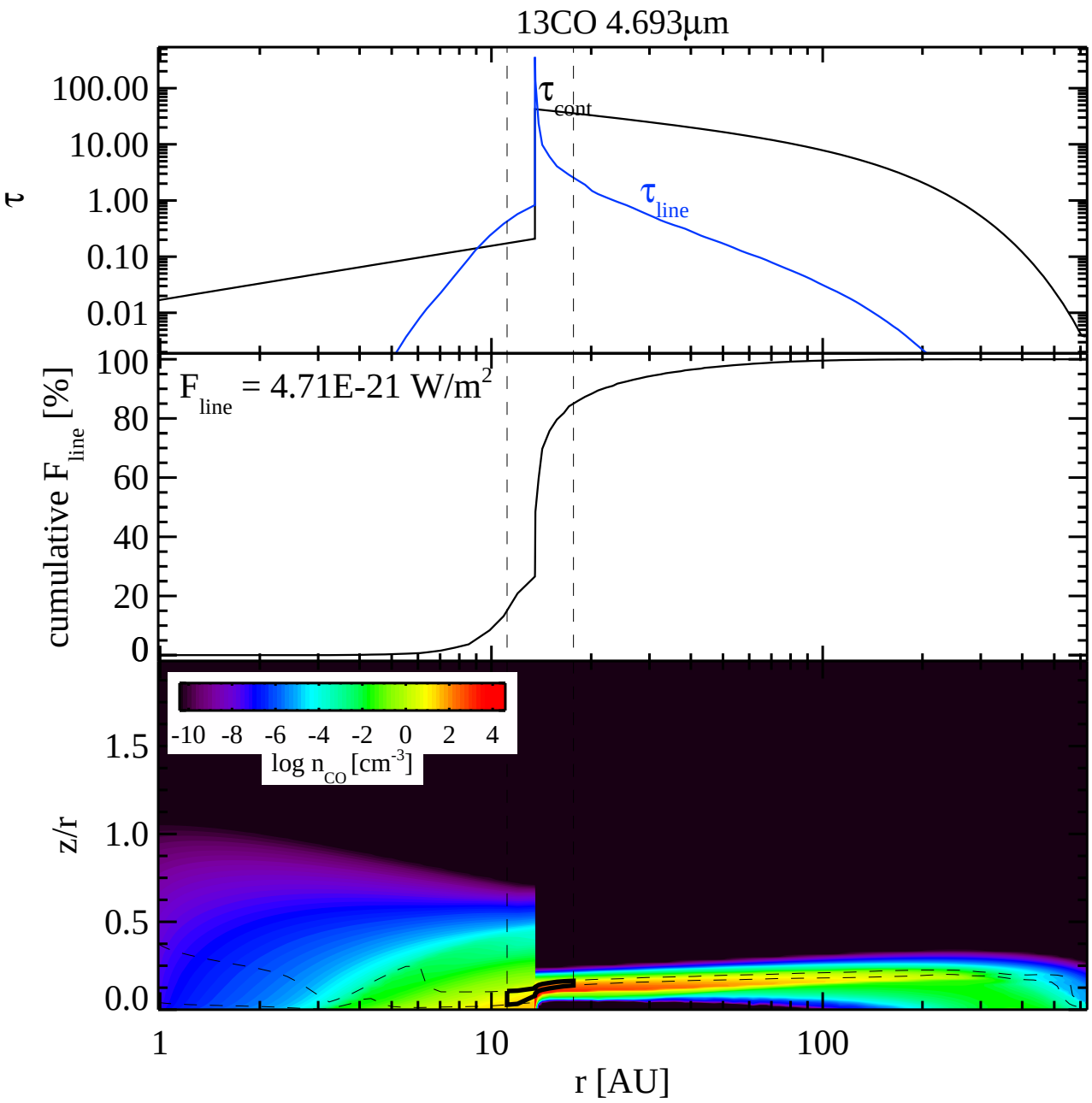

CO 4.774µm
τ
1000.00
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 4.18E-20 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

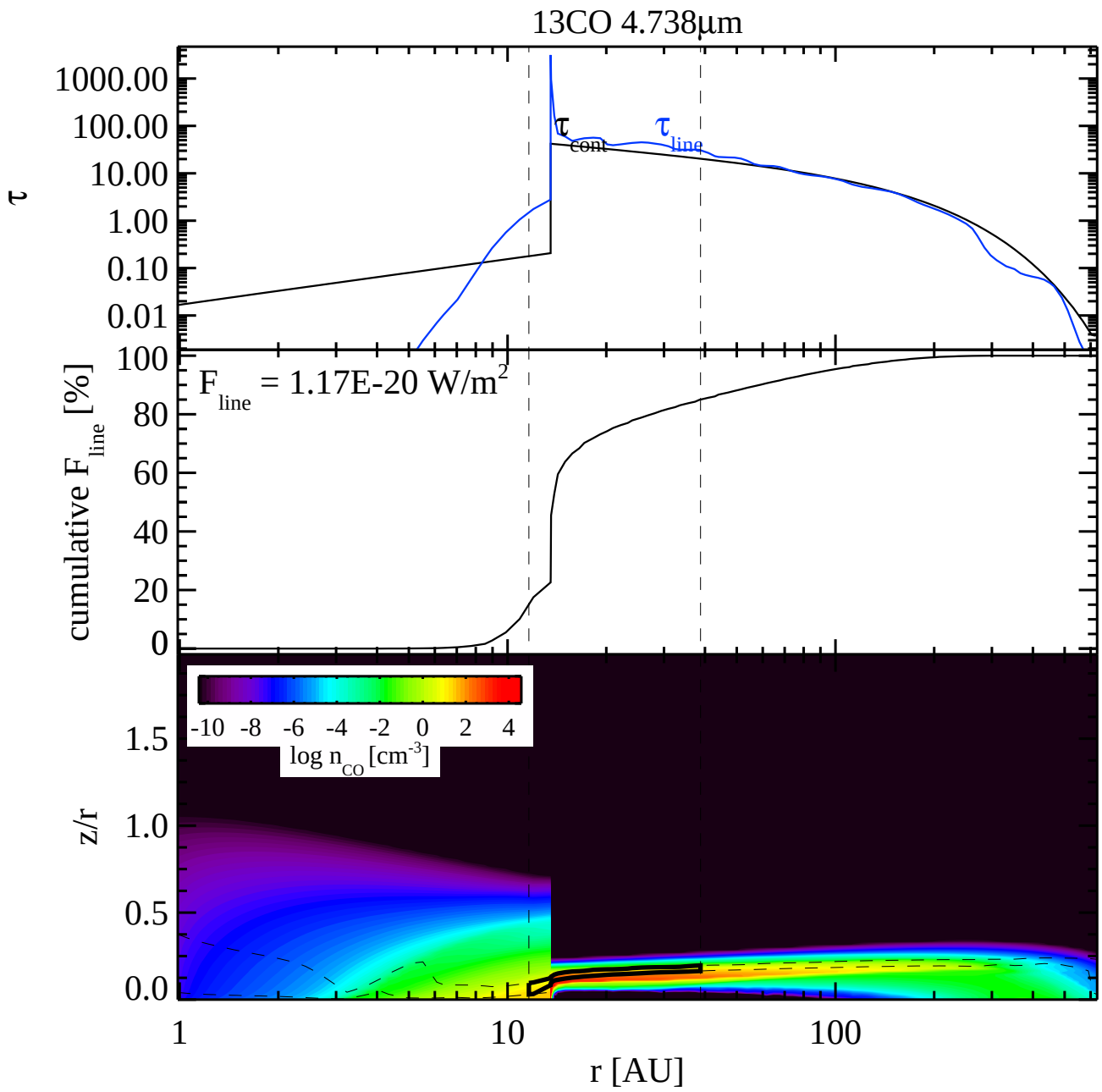

CO 4.920µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.03E-21 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

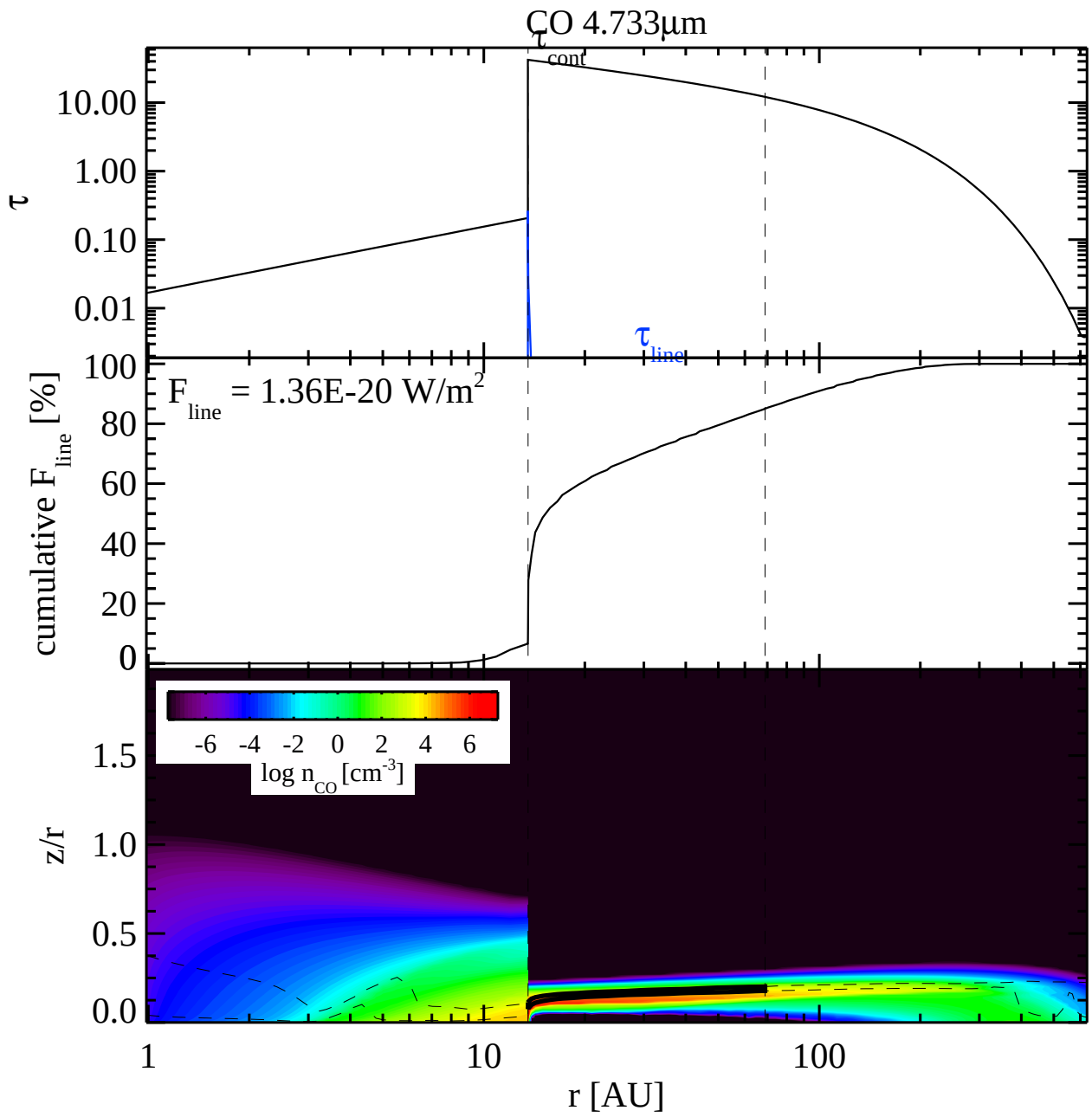

CO 4.967µm
τ
τ cont
τ line
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
cumulative F line [%]
F line = 1.75E-21 W/m2
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

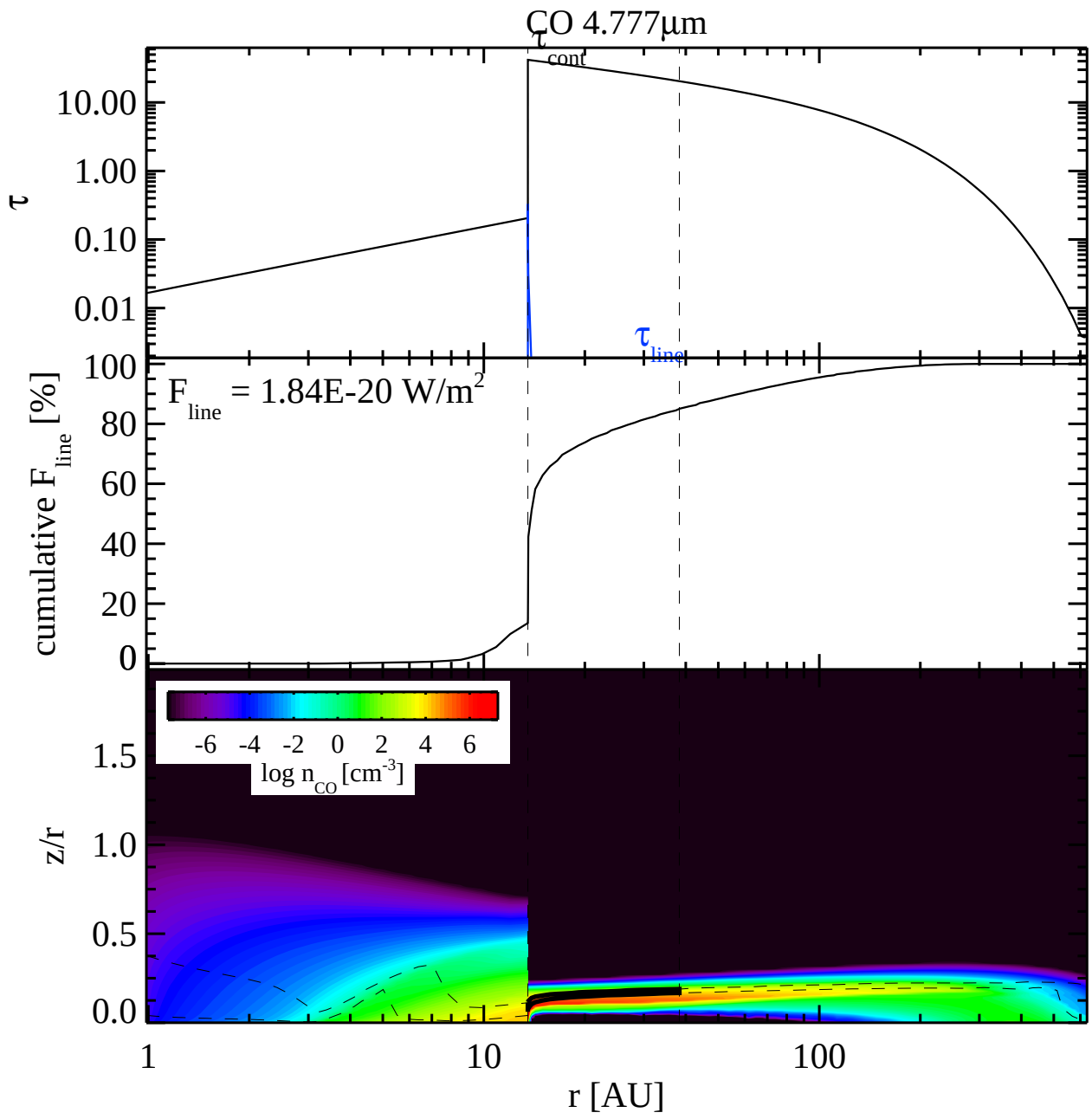

CO 5.066µm
τ
τ cont
τ line
10.00000
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
cumulative F line [%]
F line = 1.28E-21 W/m2
100
80
60
40
20
0
log n CO [cm-3]
-6 -4 -2 0 2 4 6
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

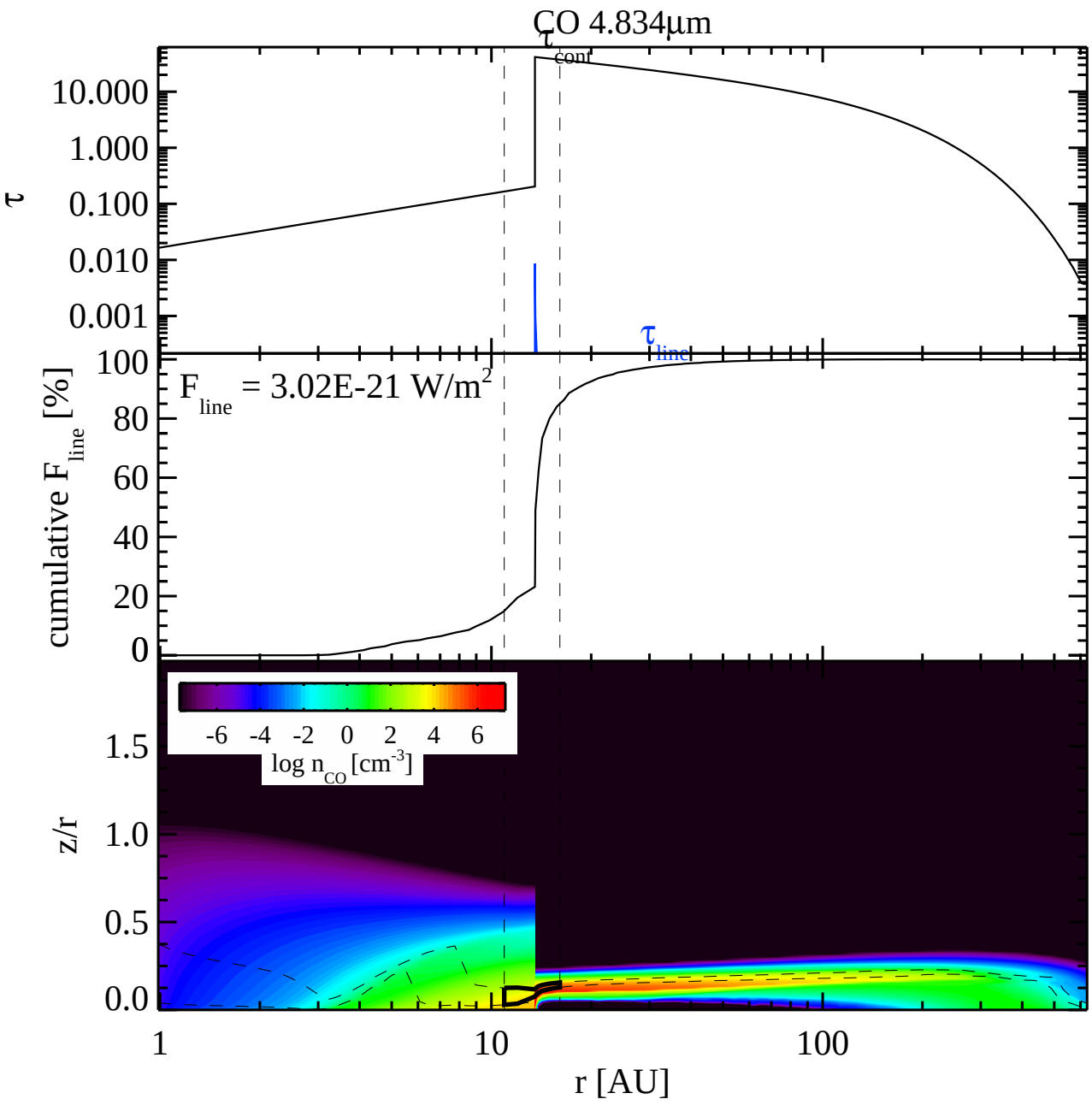

13CO 4.644µm
τ cont
τ line
τ
10.00
1.00
0.10
0.01
F line = 1.53E-22 W/m2
cumulative F line [%]
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

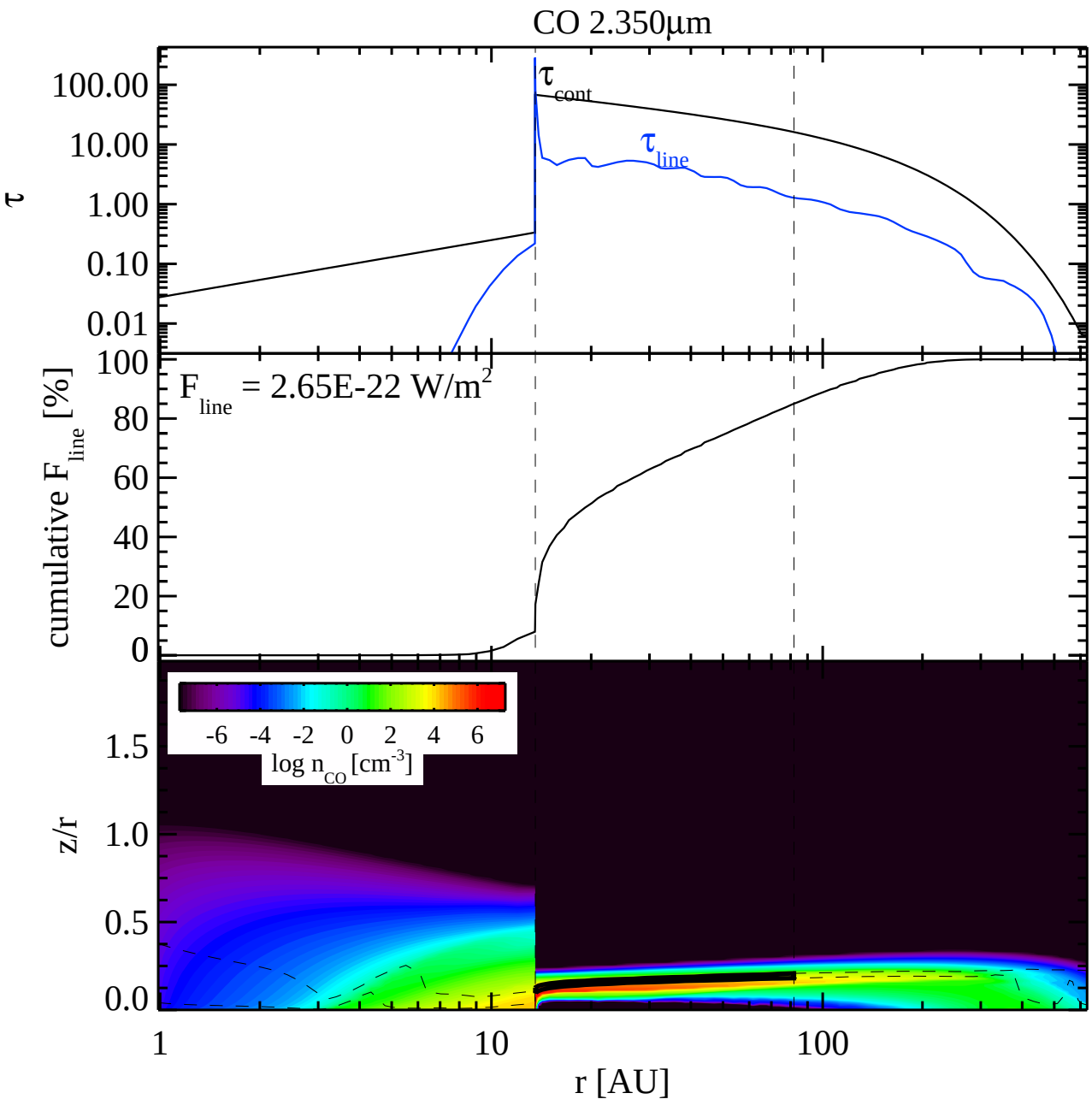

13CO 4.693µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 4.71E-21 W/m2
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

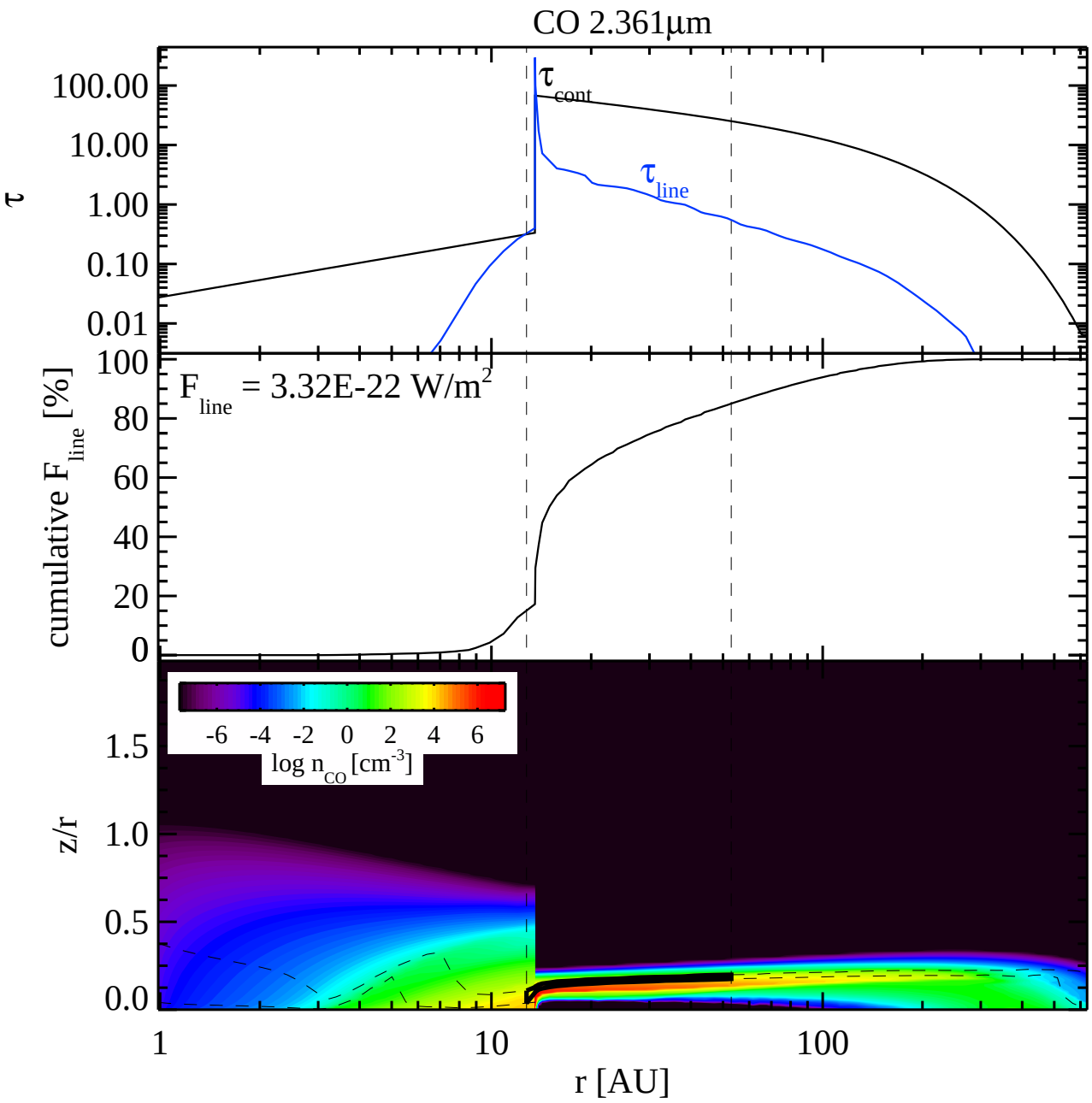

13CO 4.738µm
τ
1000.00
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.17E-20 W/m2
-10 -8 -6 -4 -2 0 2 4
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

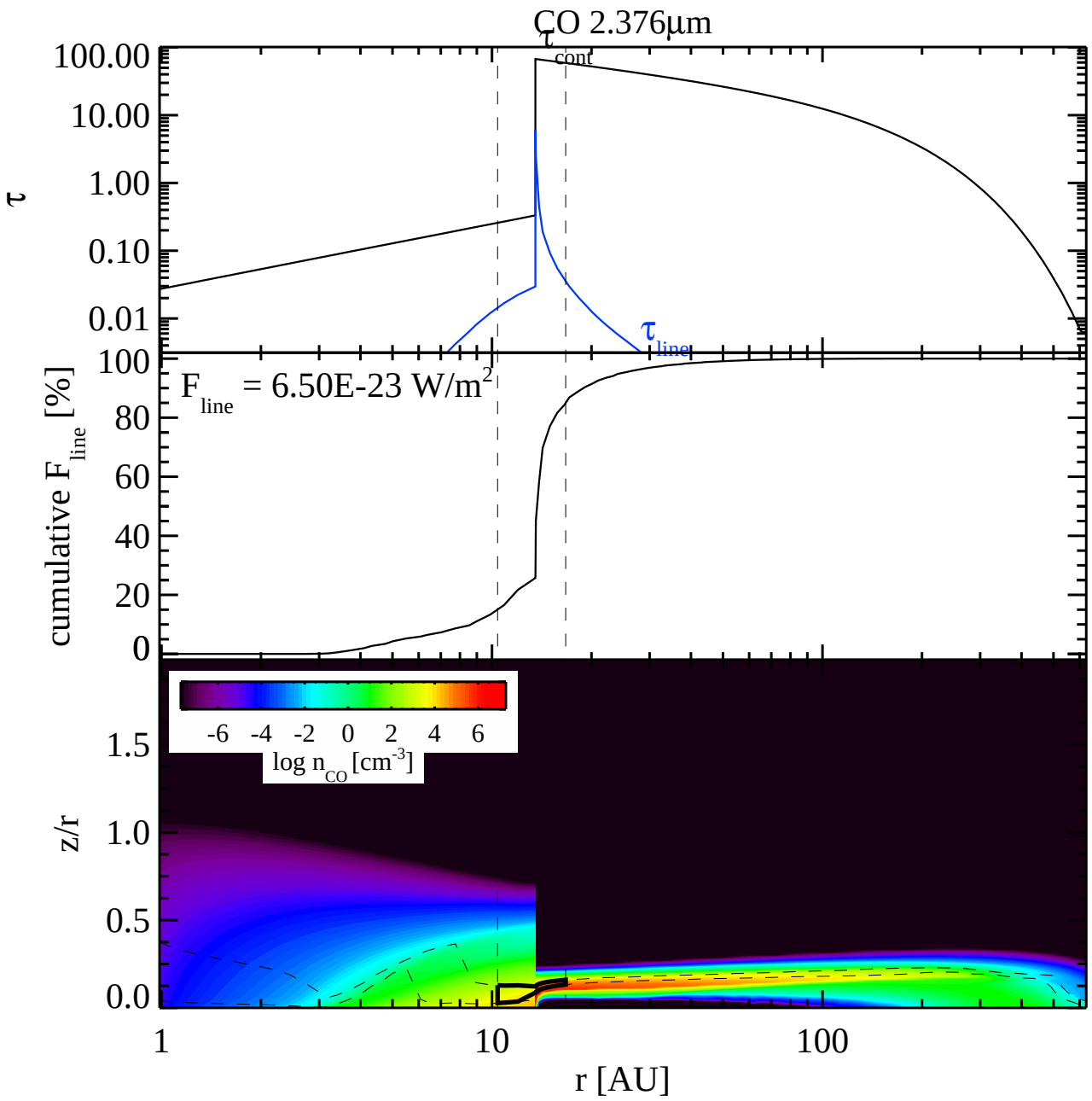

CO 4.733µm
τ cont
τ line
τ
10.00
1.00
0.10
0.01
F line = 1.36E-20 W/m2
cumulative F line [%]
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

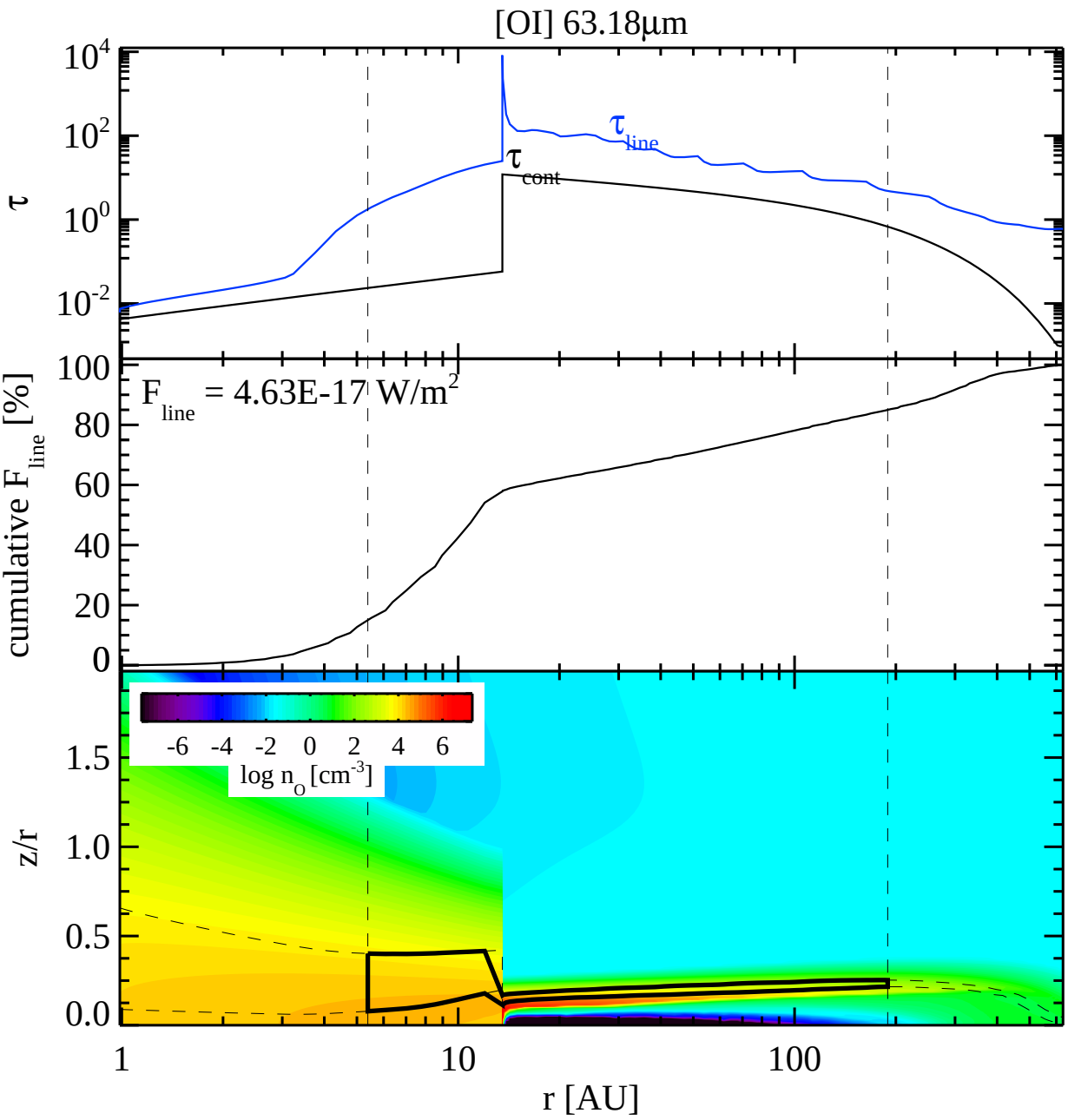

CO 4.777µm
τ
cont
τ
line
10.00
1.00
0.10
0.01
τ
F
line
= 1.84E-20 W/m
2
cumulative F
line
[%]
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n
CO
[cm
-3
]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

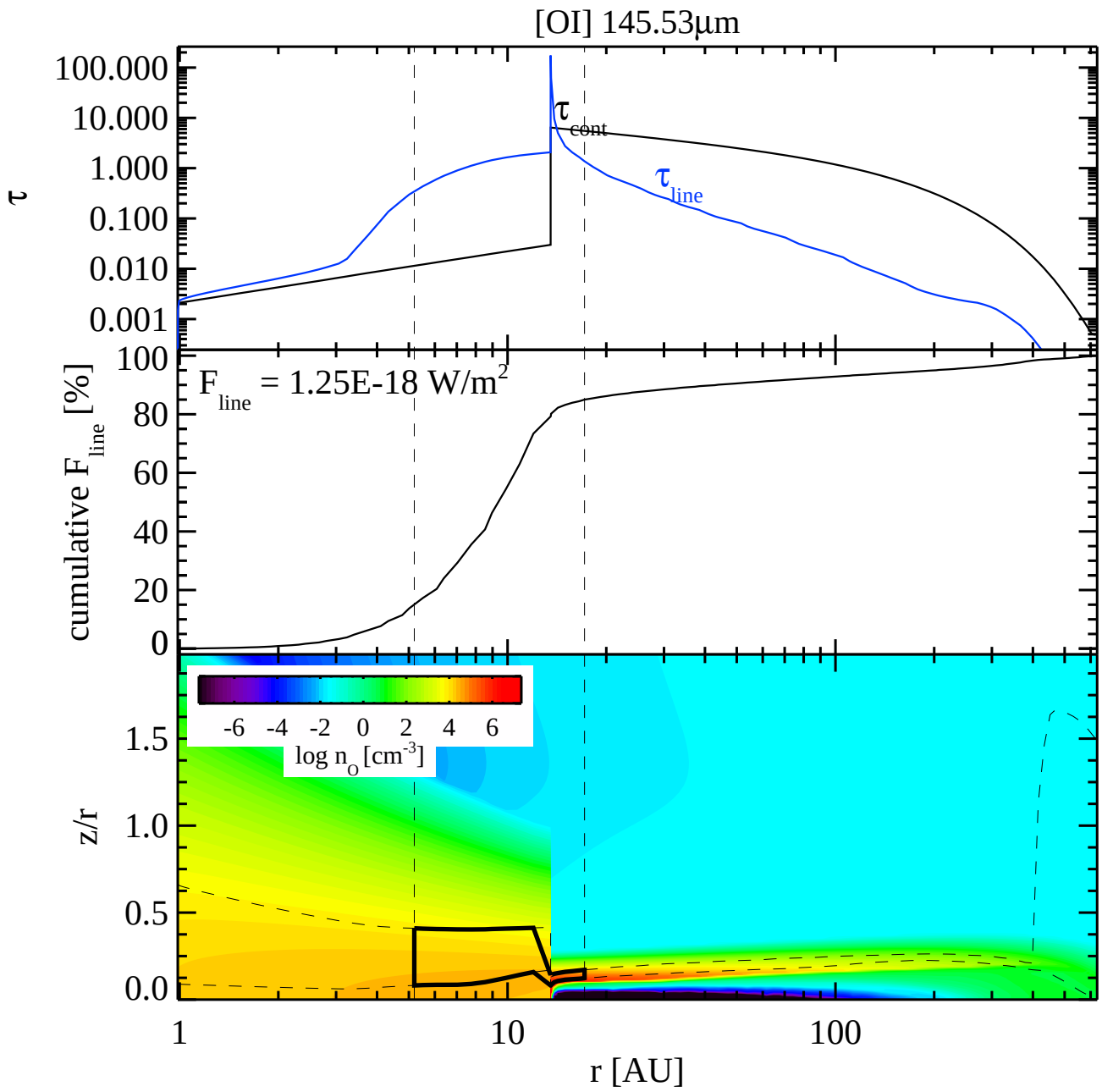

CO 4.834µm
τ_cont
τ_line
τ
10.000
1.000
0.100
0.010
0.001
F_line = 3.02E-21 W/m²
cumulative F_line [%]
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n_CO [cm⁻³]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

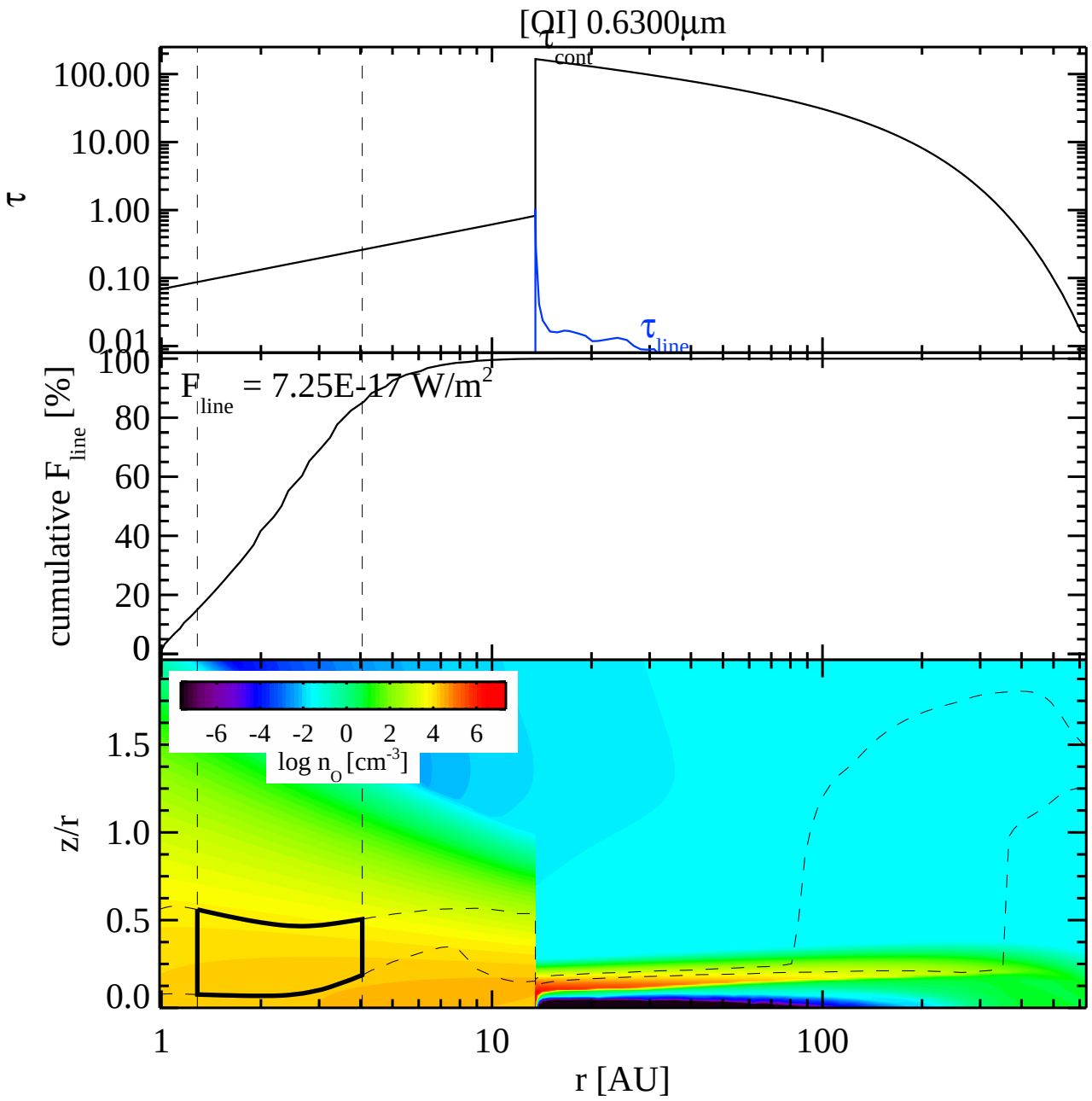

CO 2.350µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.65E-22 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

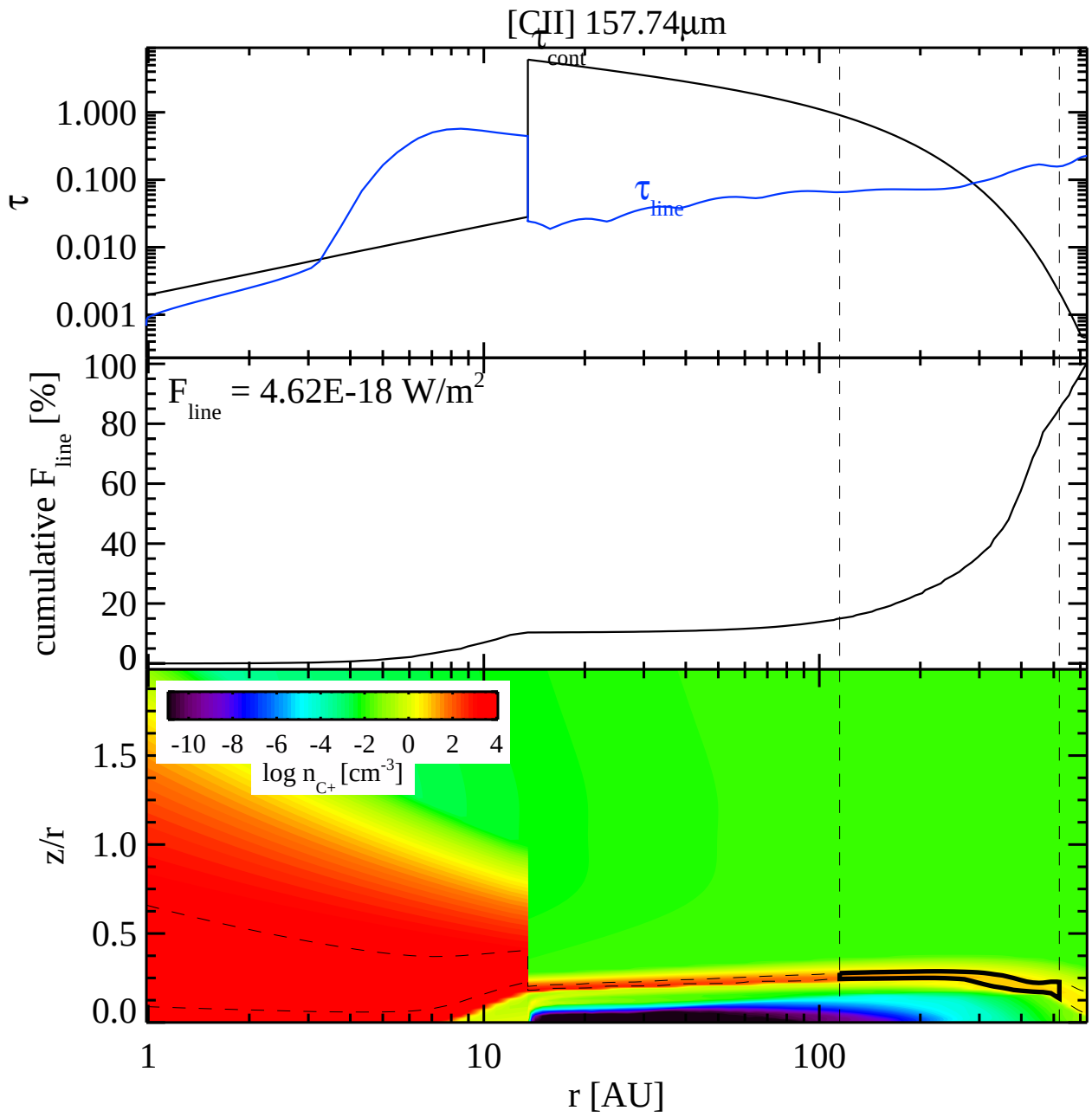

CO 2.361µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.32E-22 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

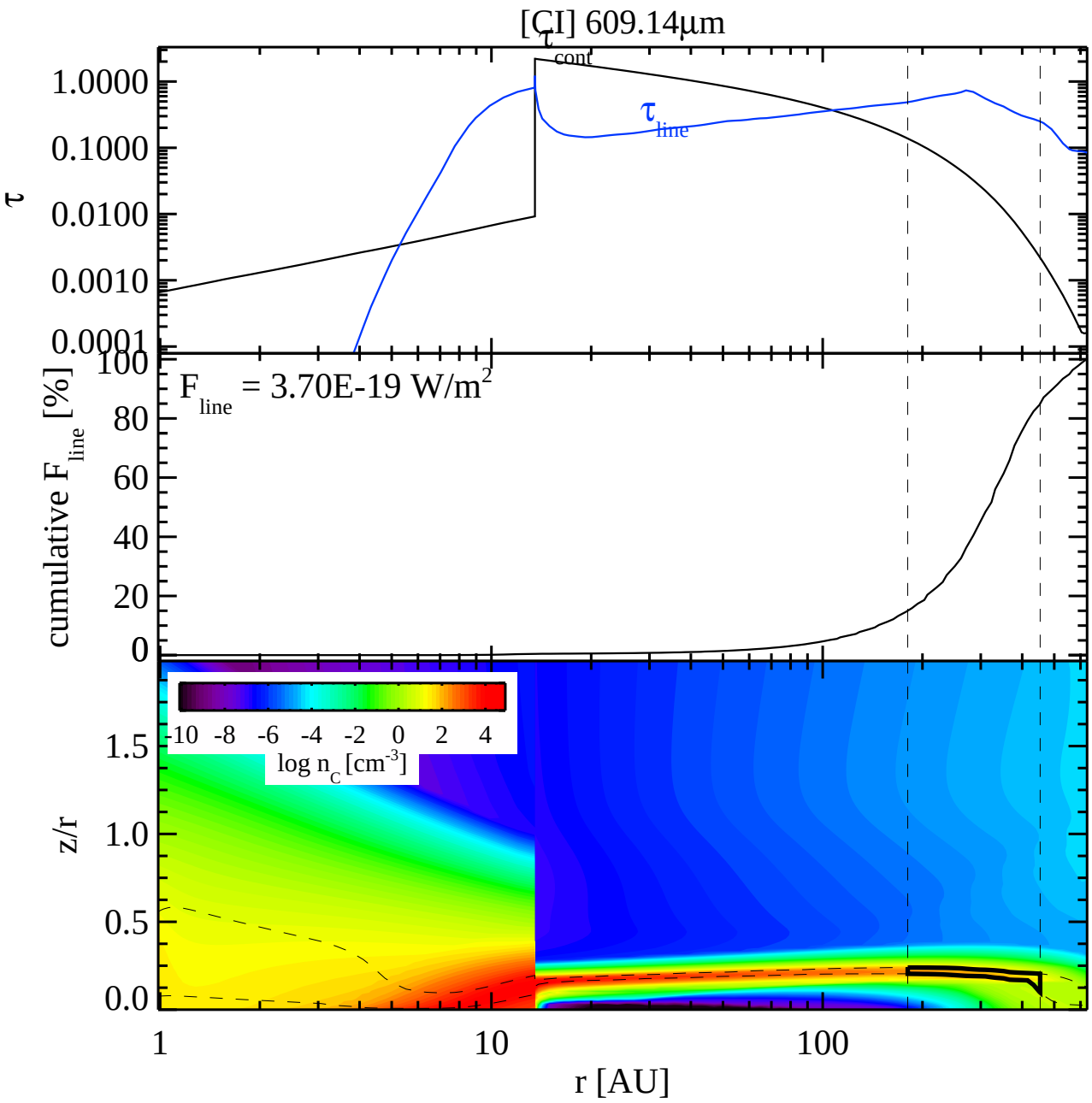

CO 2.376µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 6.50E-23 W/m2
-6 -4 -2 0 2 4 6
log n CO [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

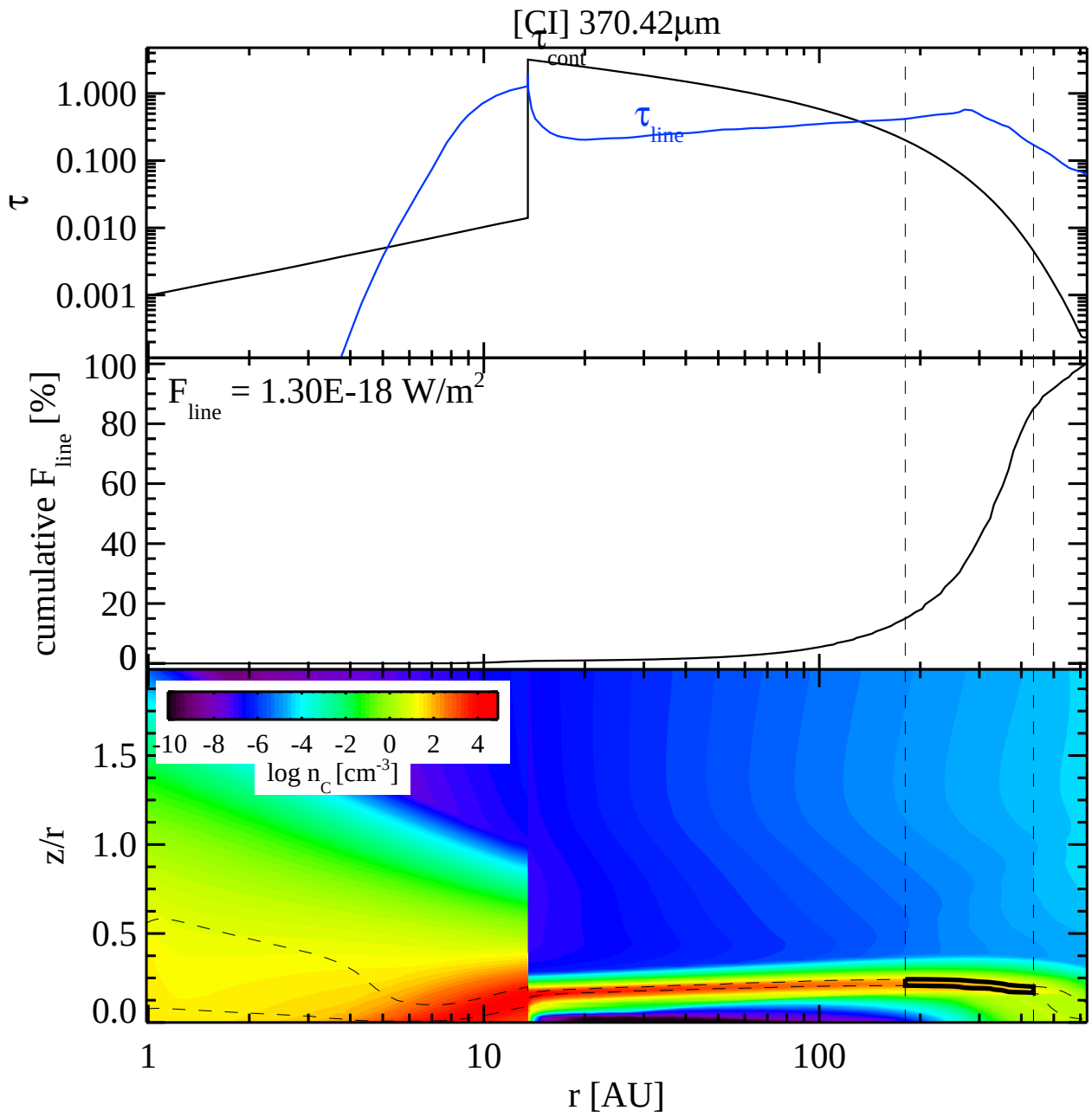

[OI] 63.18μm
τ
10^4
10^2
10^0
10^{-2}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
F_{line} = 4.63E-17 W/m^2
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n_O [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

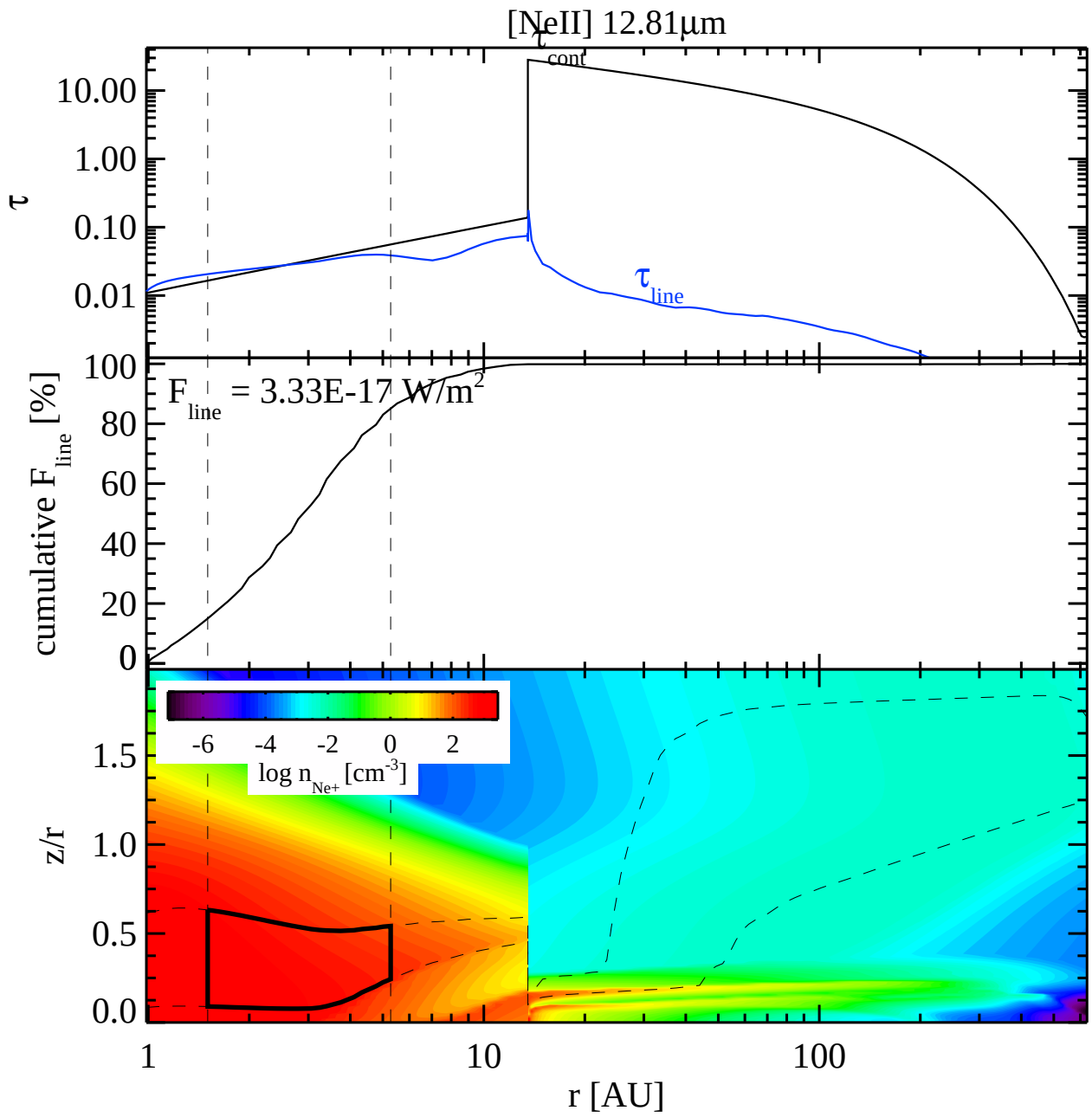

[OI] 145.53µm
τ
100.000
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.25E-18 W/m2
-6 -4 -2 0 2 4 6
log n O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

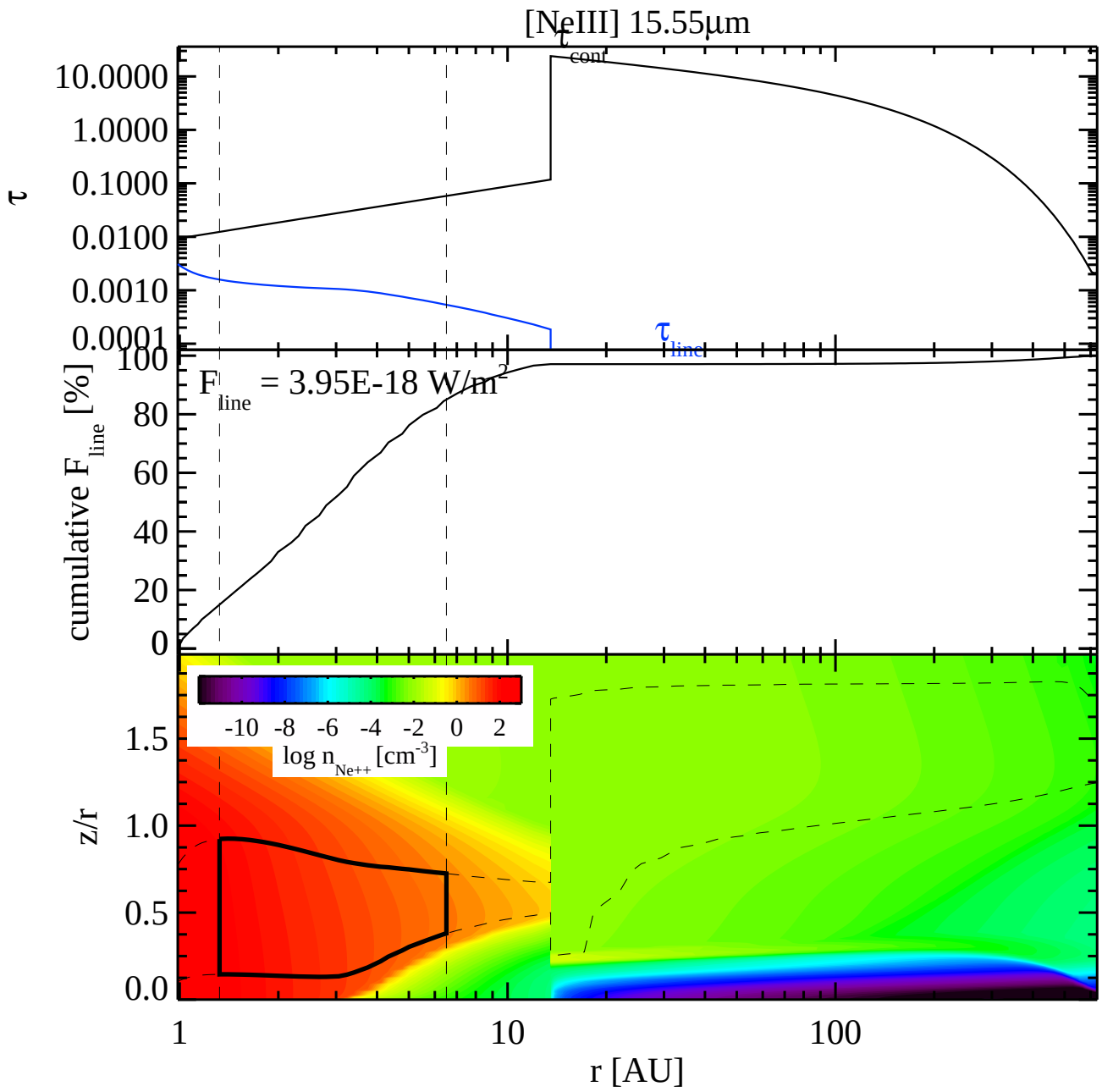

[OI] 0.6300µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 7.25E-17 W/m2
-6 -4 -2 0 2 4 6
log n O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

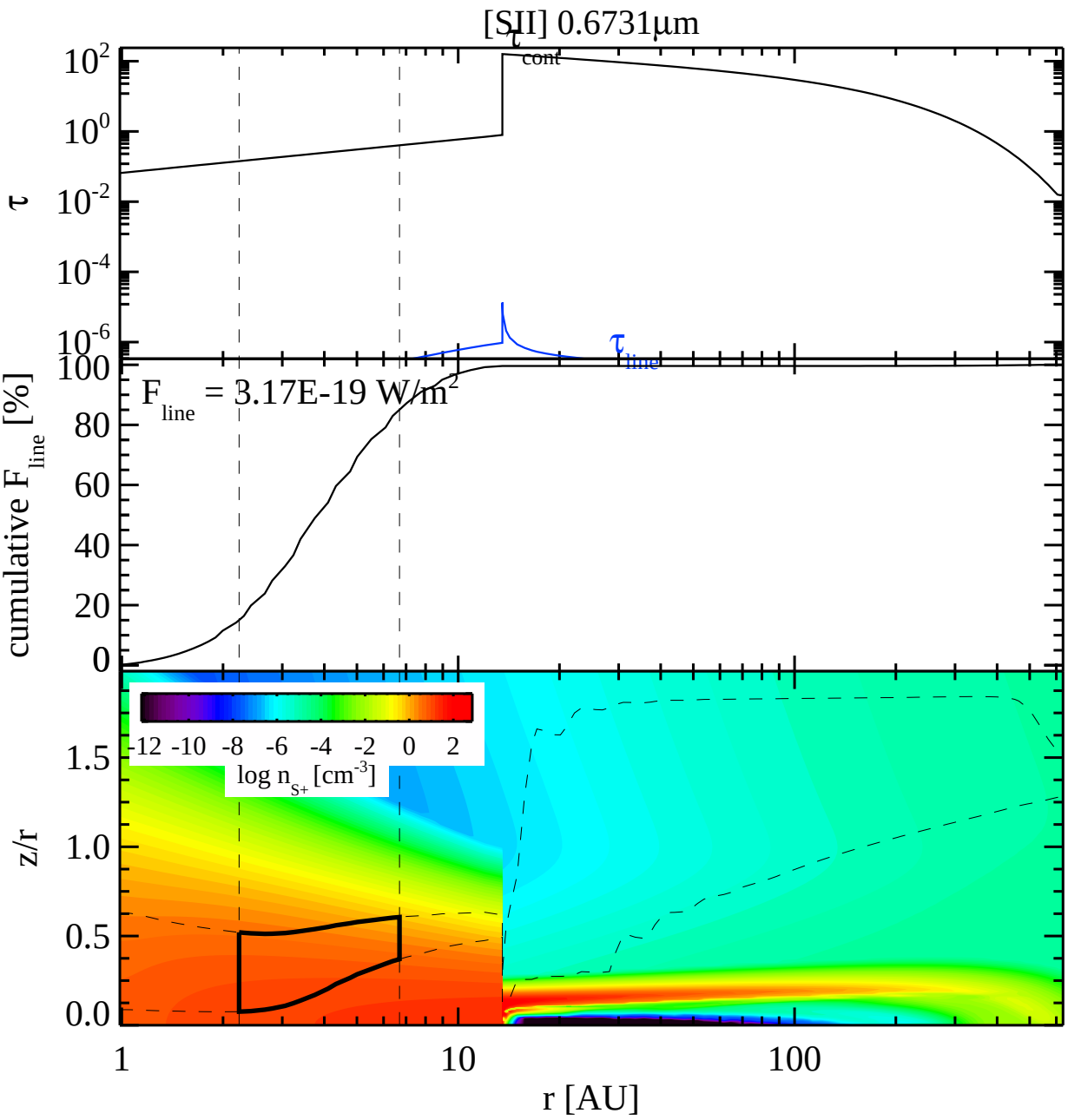

[CII] 157.74µm
τ
τ_cont
τ_line
1.000
0.100
0.010
0.001
cumulative F_line [%]
F_line = 4.62E-18 W/m²
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2 4
log n_C+ [cm⁻³]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

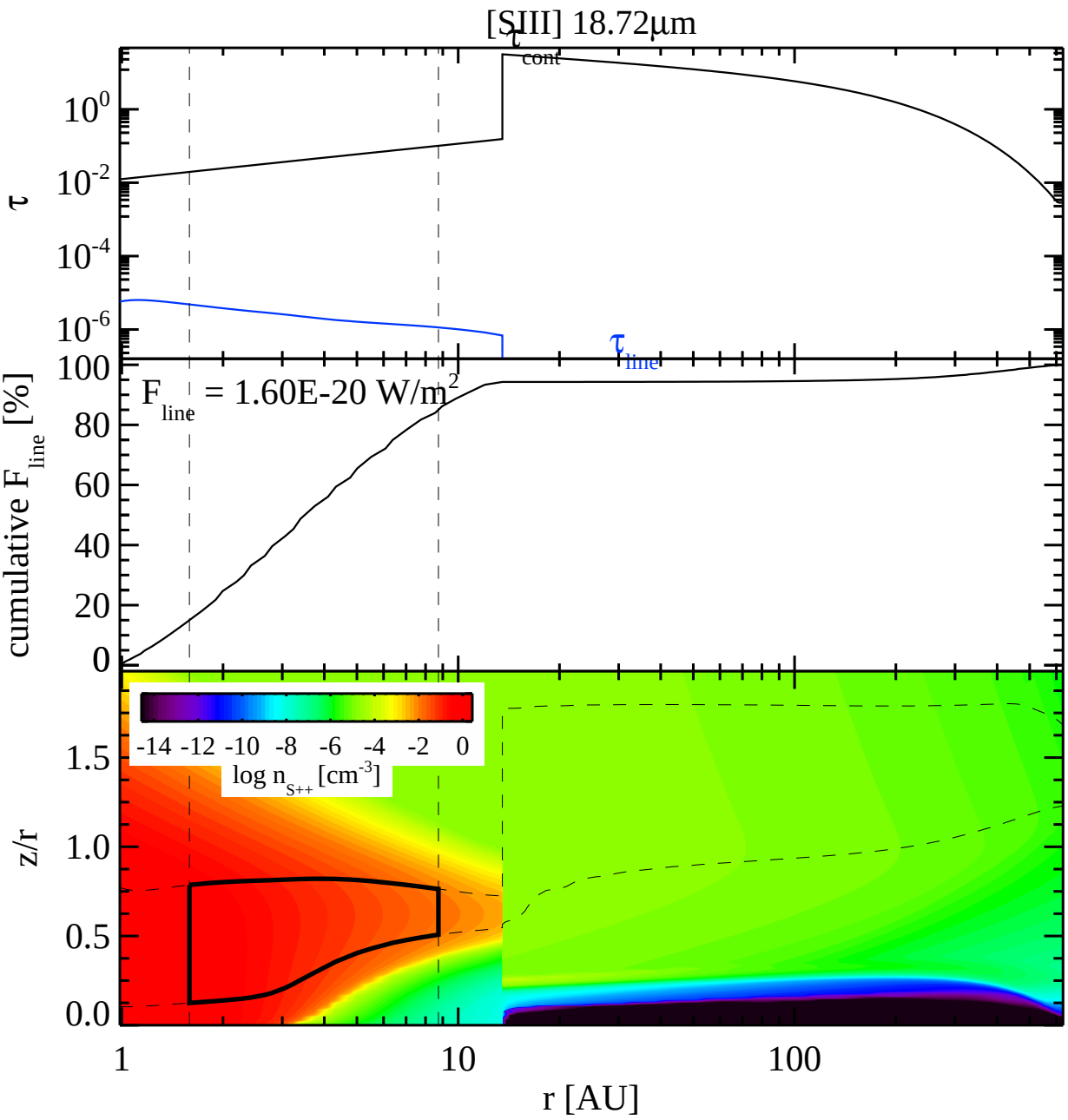

[CI] 609.14µm
τ
τ cont
τ line
1.0000
0.1000
0.0100
0.0010
0.0001
cumulative F line [%]
F line = 3.70E-19 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2 4
log n C [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

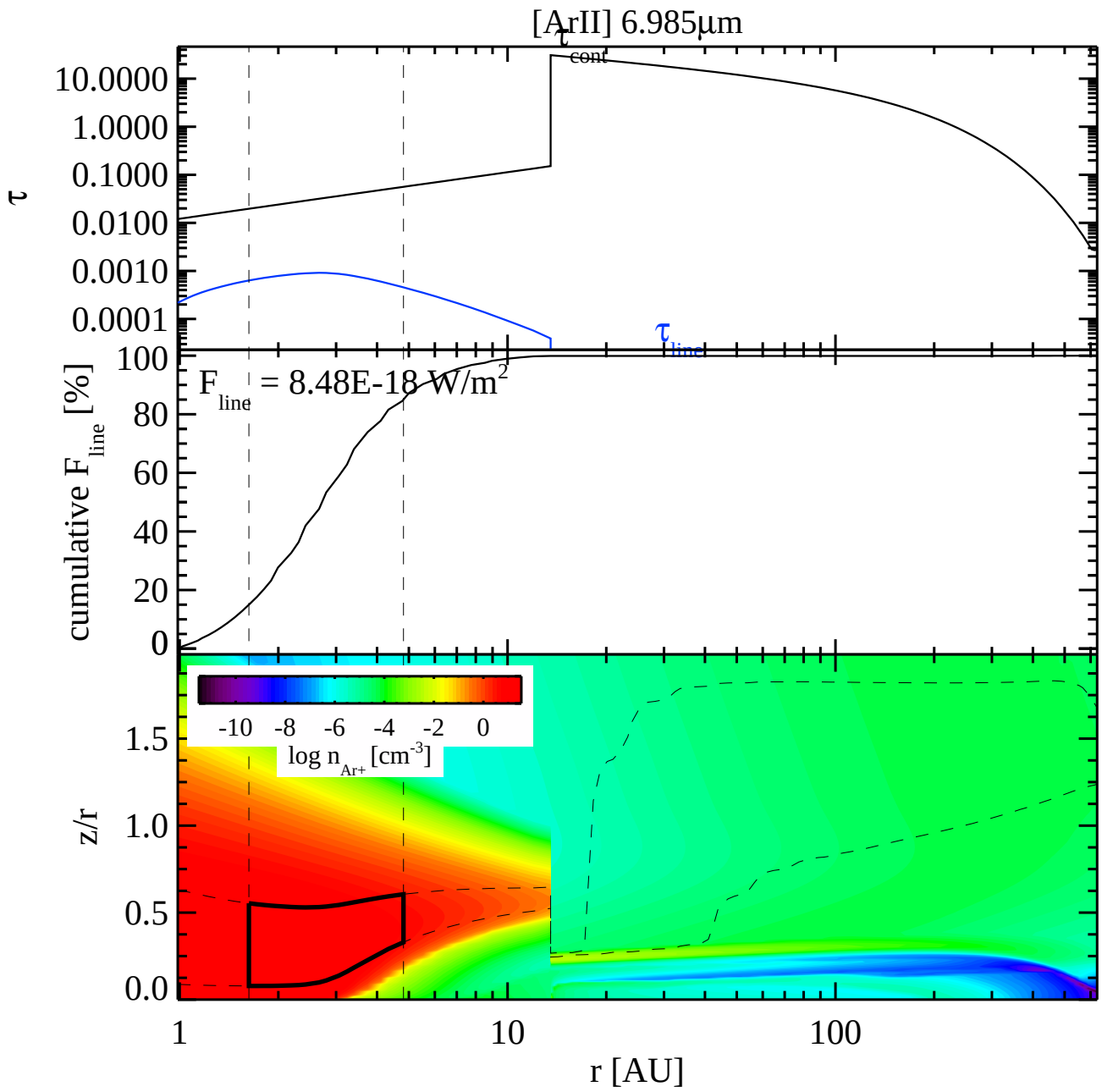

[CI] 370.42µm
τ
τ cont
τ line
1.000
0.100
0.010
0.001
cumulative F line [%]
F line = 1.30E-18 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2 4
log n C [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

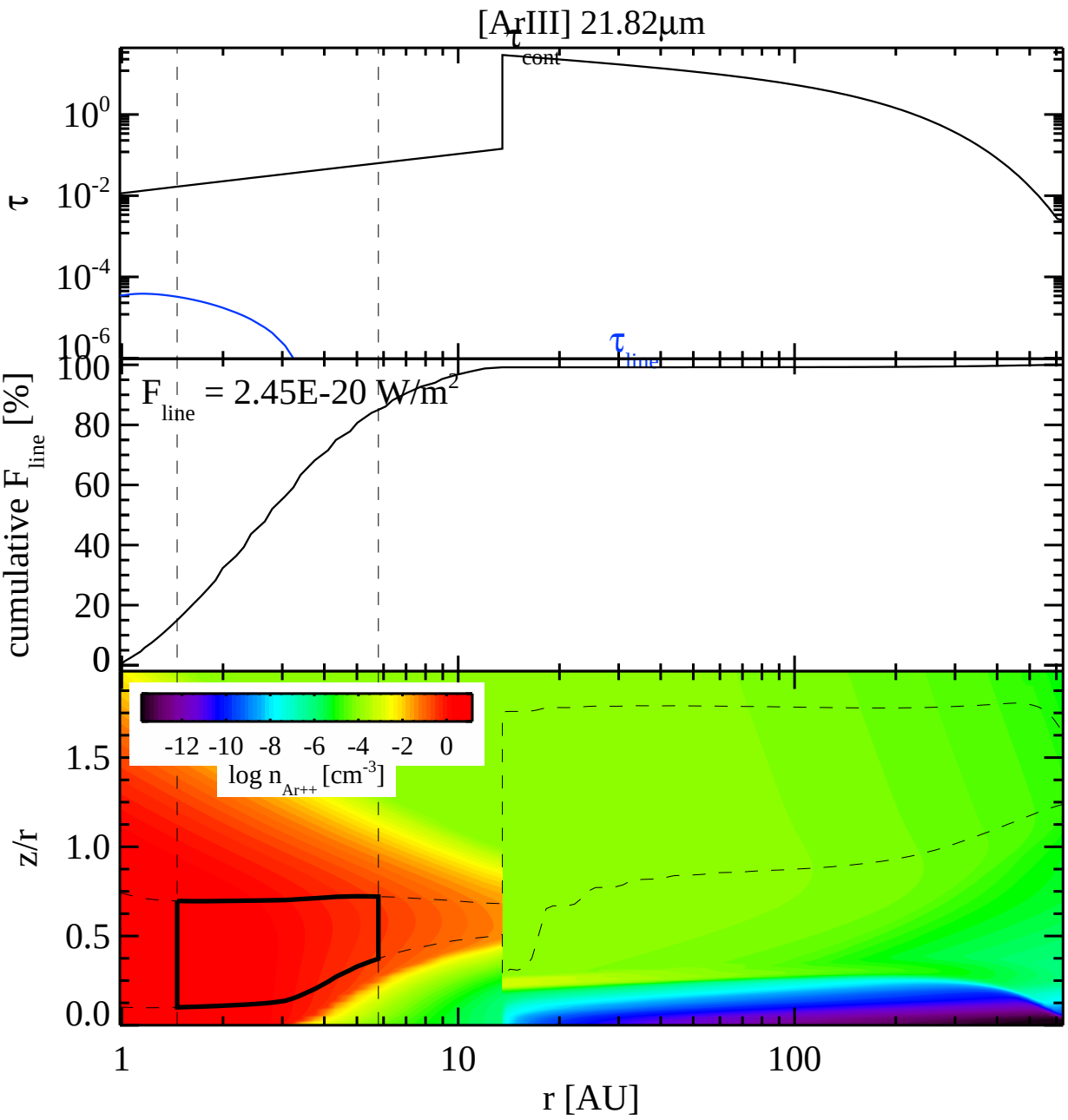

[NeII] 12.81µm
τ cont
τ line
τ
10.00
1.00
0.10
0.01
F line = 3.33E-17 W/m2
cumulative F line [%]
100
80
60
40
20
0
-6
-4
-2
0
2
log n Ne+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

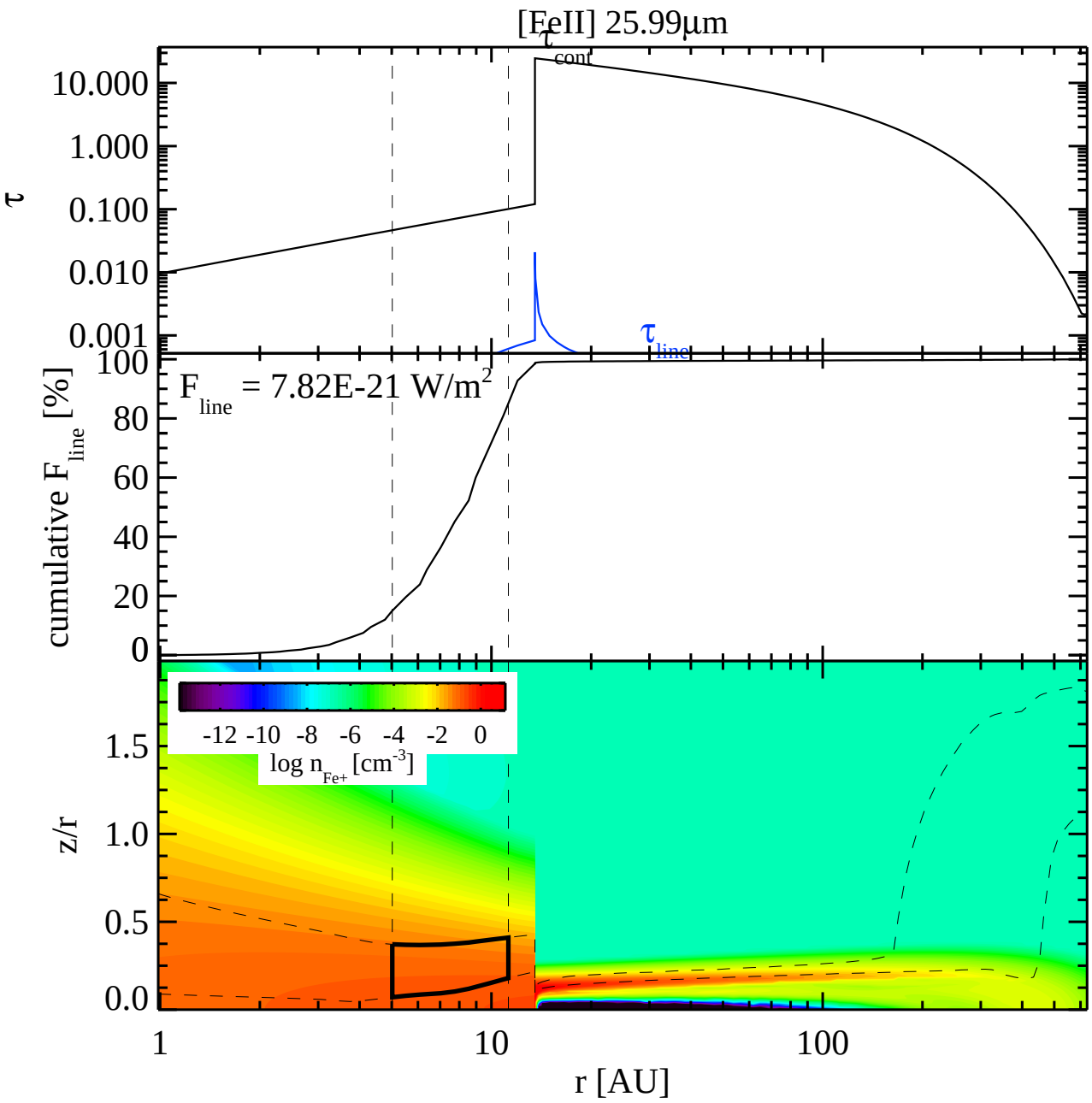

[NeIII] 15.55µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.95E-18 W/m2
-10 -8 -6 -4 -2 0 2
log n Ne++ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

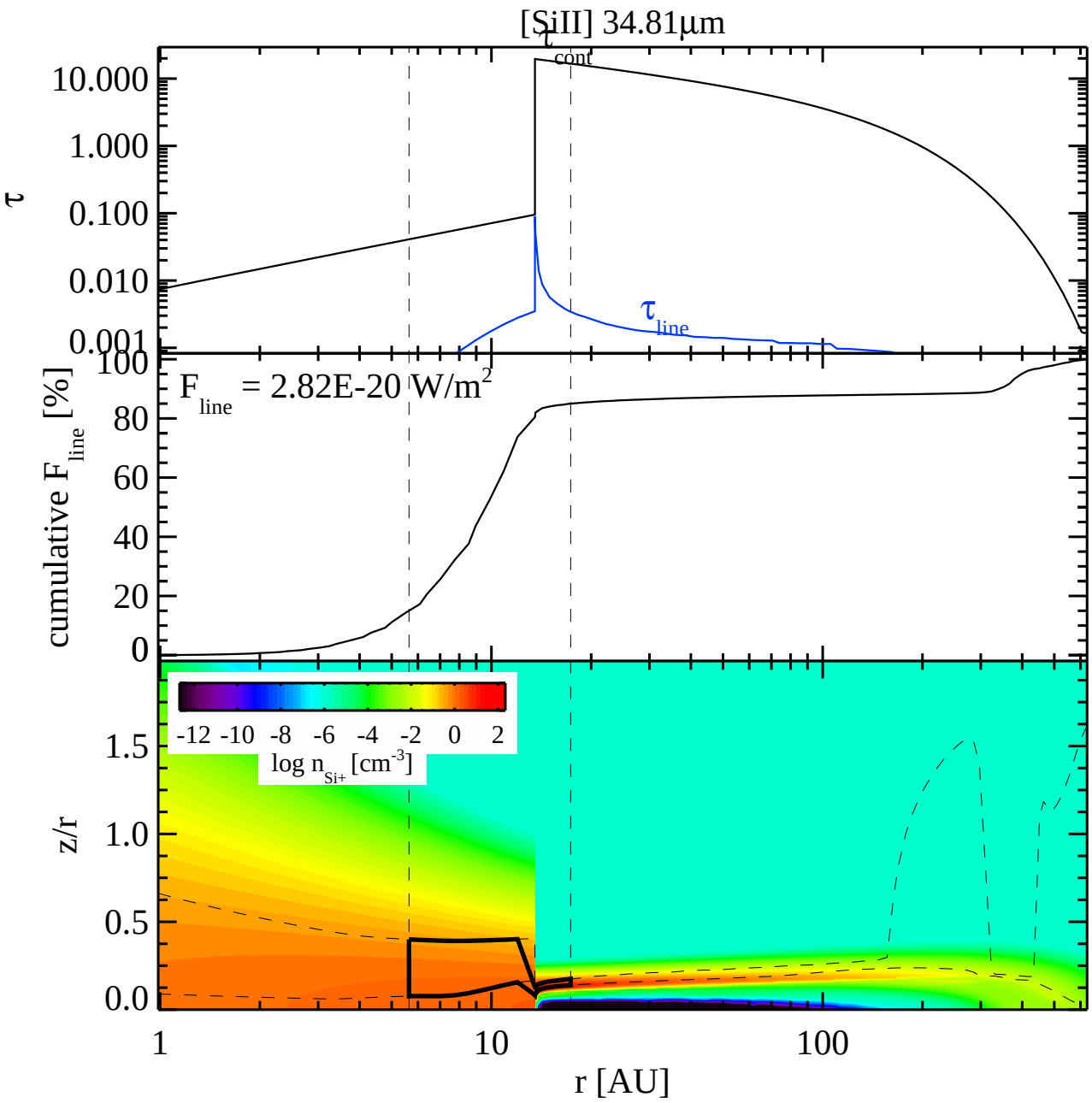

[SII] 0.6731µm
τ
cont
τ
line
τ
10^2
10^0
10^-2
10^-4
10^-6
cumulative F
line
[%]
F
line
= 3.17E-19 W/m^2
100
80
60
40
20
0
z/r
1.5
1.0
0.5
0.0
-12 -10 -8 -6 -4 -2 0 2
log n
S+
[cm^-3]
1
10
100
r [AU]

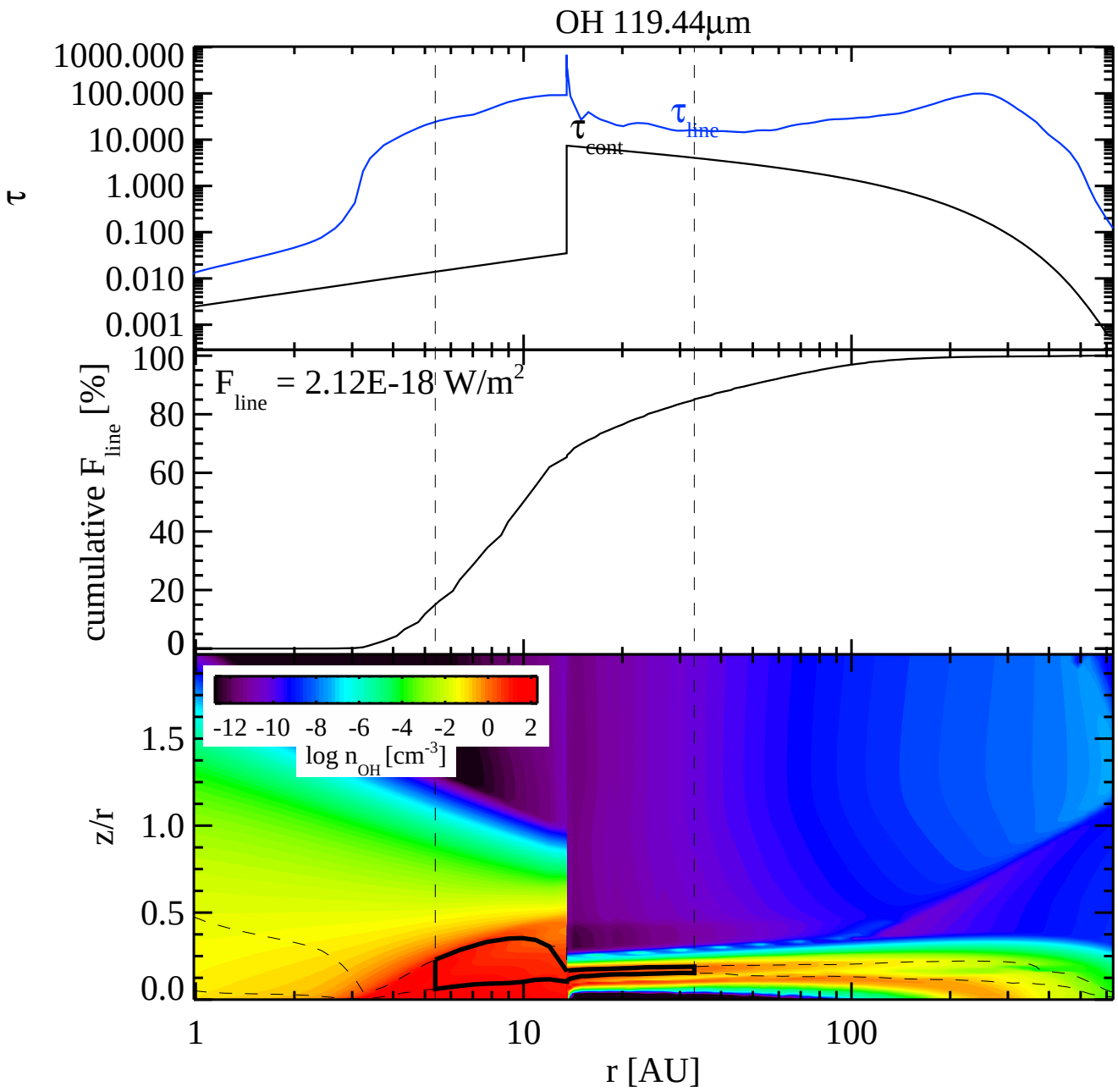

[SIII] 18.72µm
τ
cont
τ
line
τ
10^0
10^-2
10^-4
10^-6
cumulative F_line [%]
F_line = 1.60E-20 W/m^2
100
80
60
40
20
0
log n_S++ [cm^-3]
-14 -12 -10 -8 -6 -4 -2 0
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

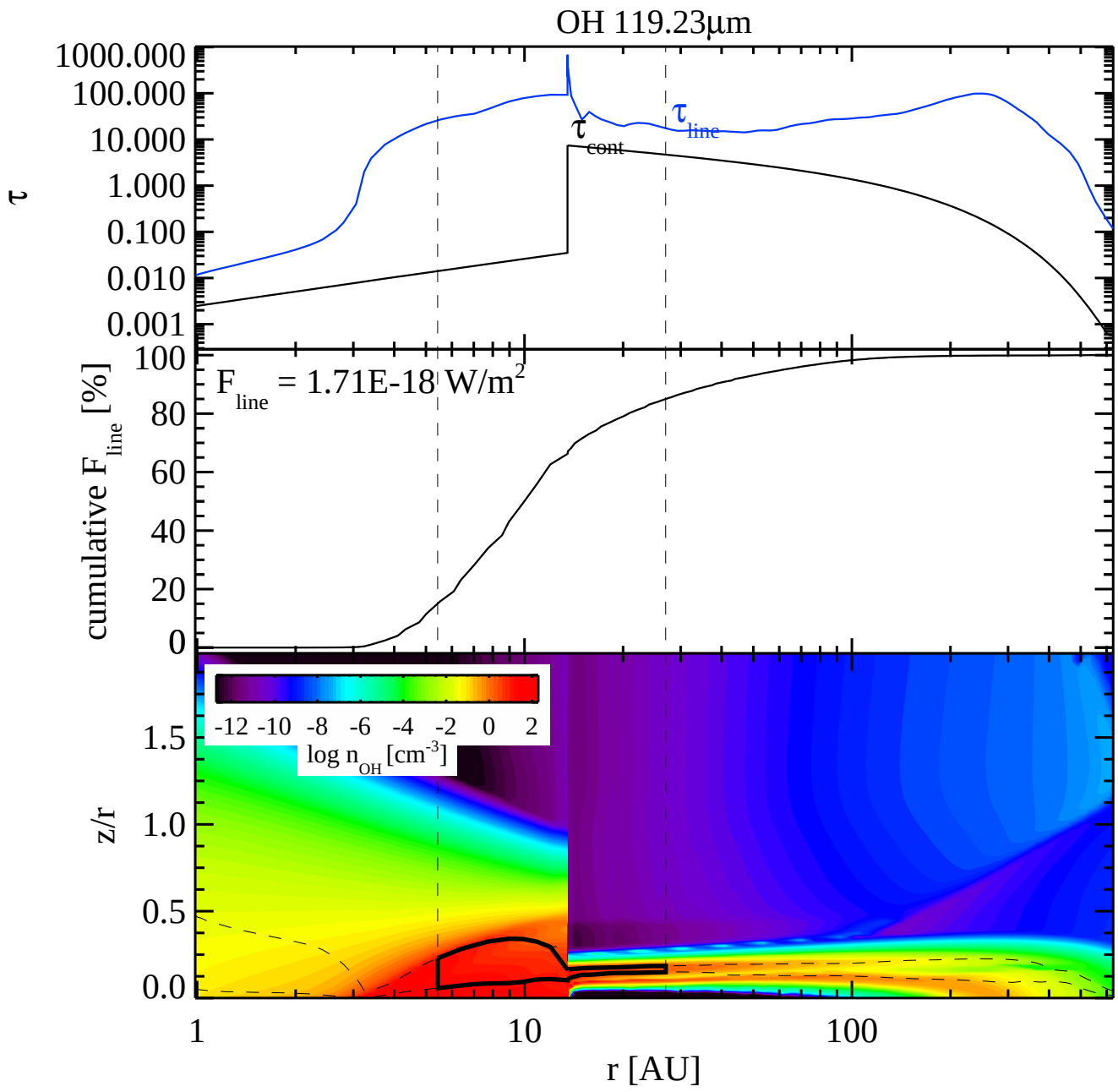

[ArII] 6.985µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 8.48E-18 W/m2
-10 -8 -6 -4 -2 0
log n Ar+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

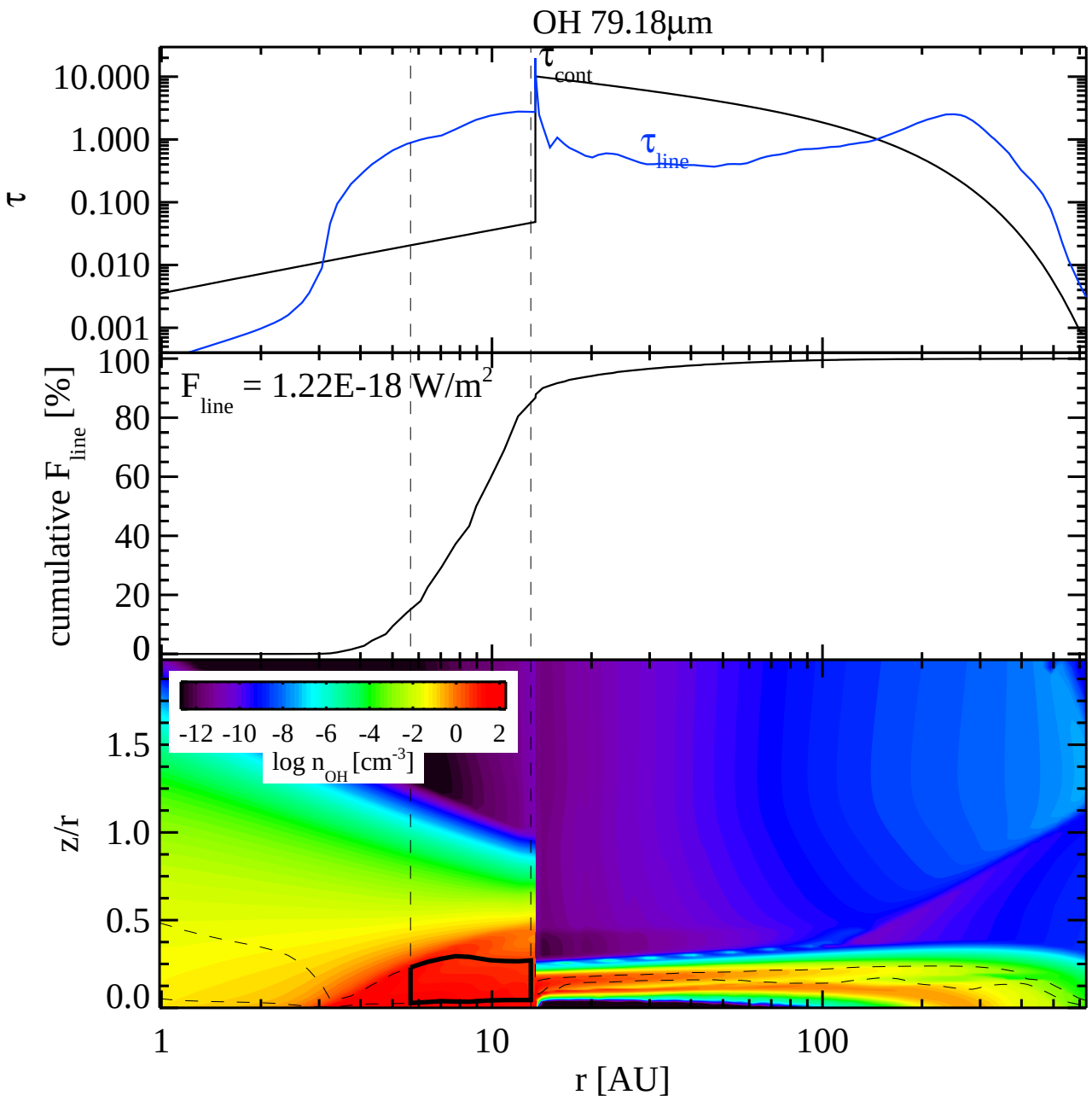

[ArIII] 21.82µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
cumulative F line [%]
F line = 2.45E-20 W/m^2
100
80
60
40
20
0
-12 -10 -8 -6 -4 -2 0
log n Ar++ [cm^-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

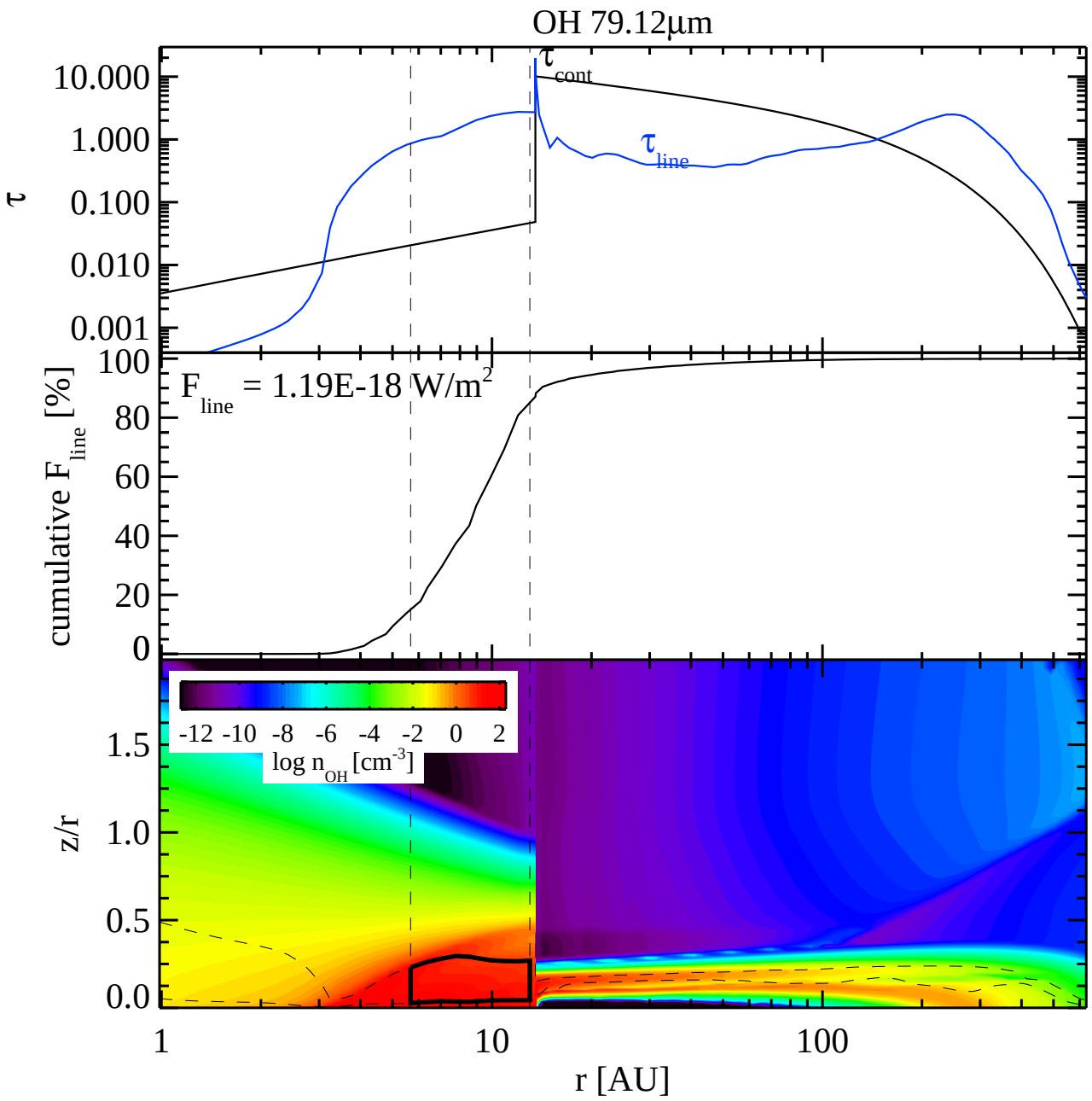

[FeII] 25.99µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 7.82E-21 W/m2
-12 -10 -8 -6 -4 -2 0
log n Fe+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

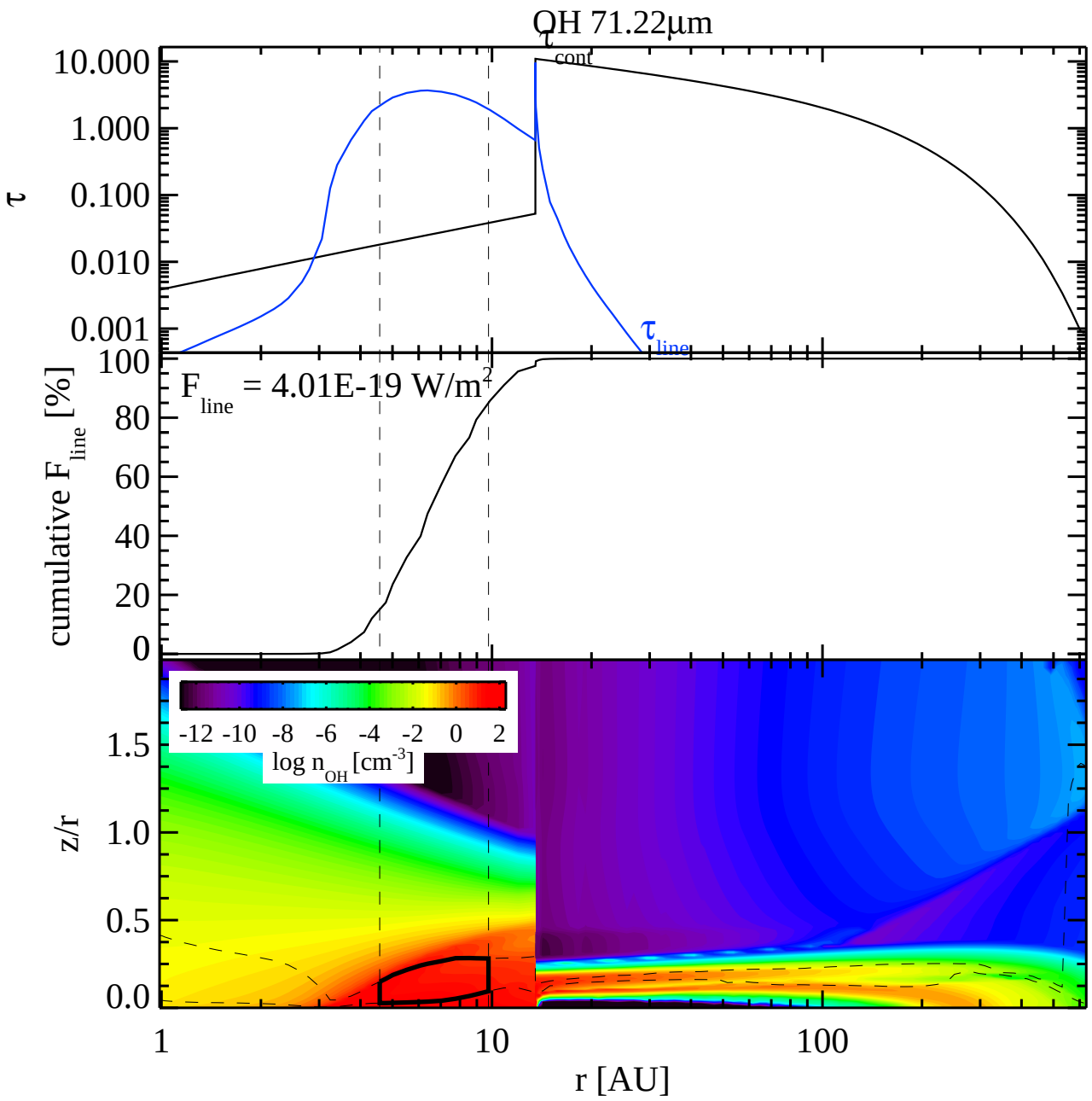

[SiII] 34.81µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.82E-20 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n Si+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

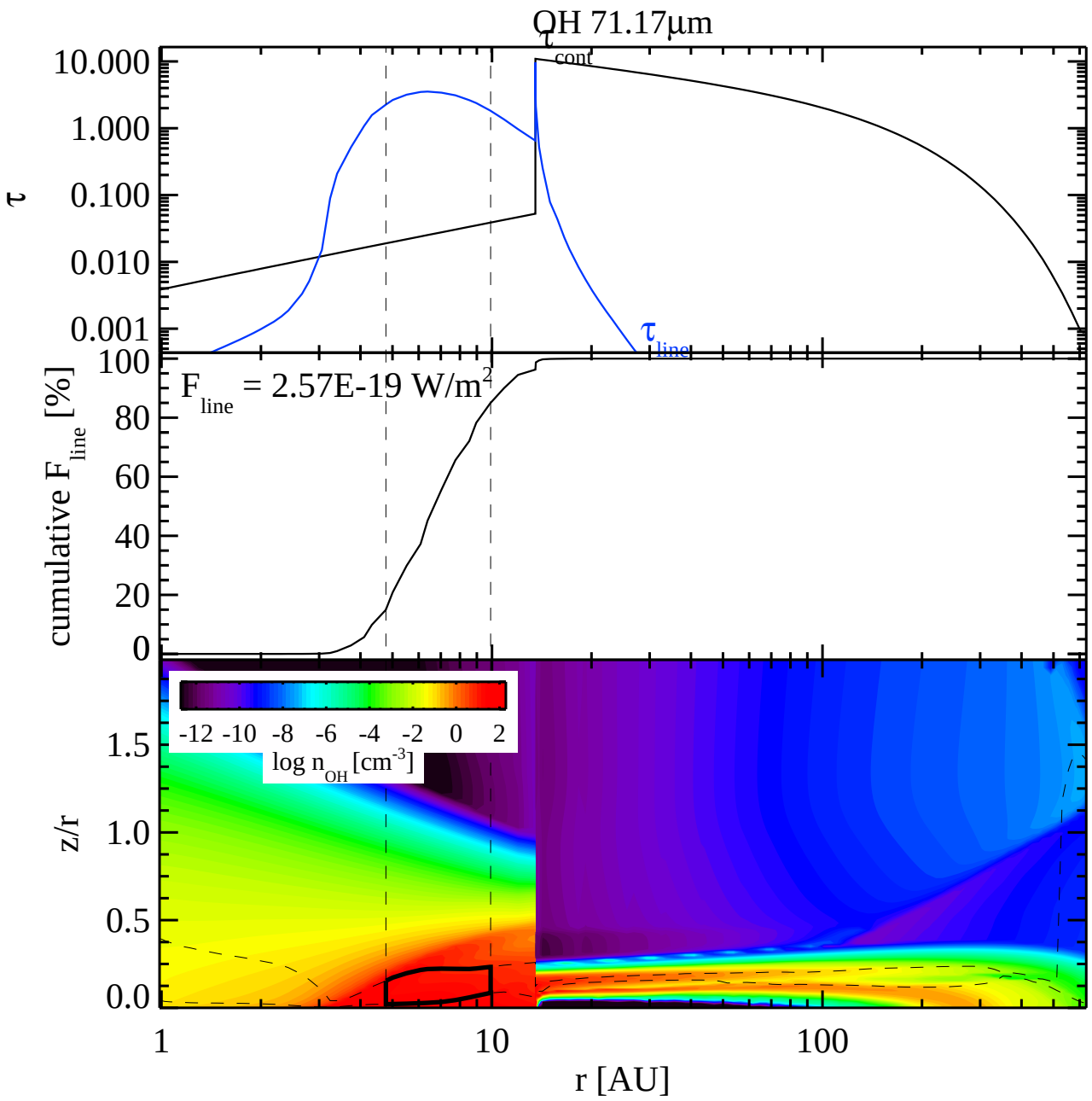

OH 119.44µm
τ
1000.000
100.000
10.000
1.000
0.100
0.010
0.001
τ line
τ cont
cumulative F line [%]
100
80
60
40
20
0
F line = 2.12E-18 W/m2
z/r
1.5
1.0
0.5
0.0
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
1
10
100
r [AU]

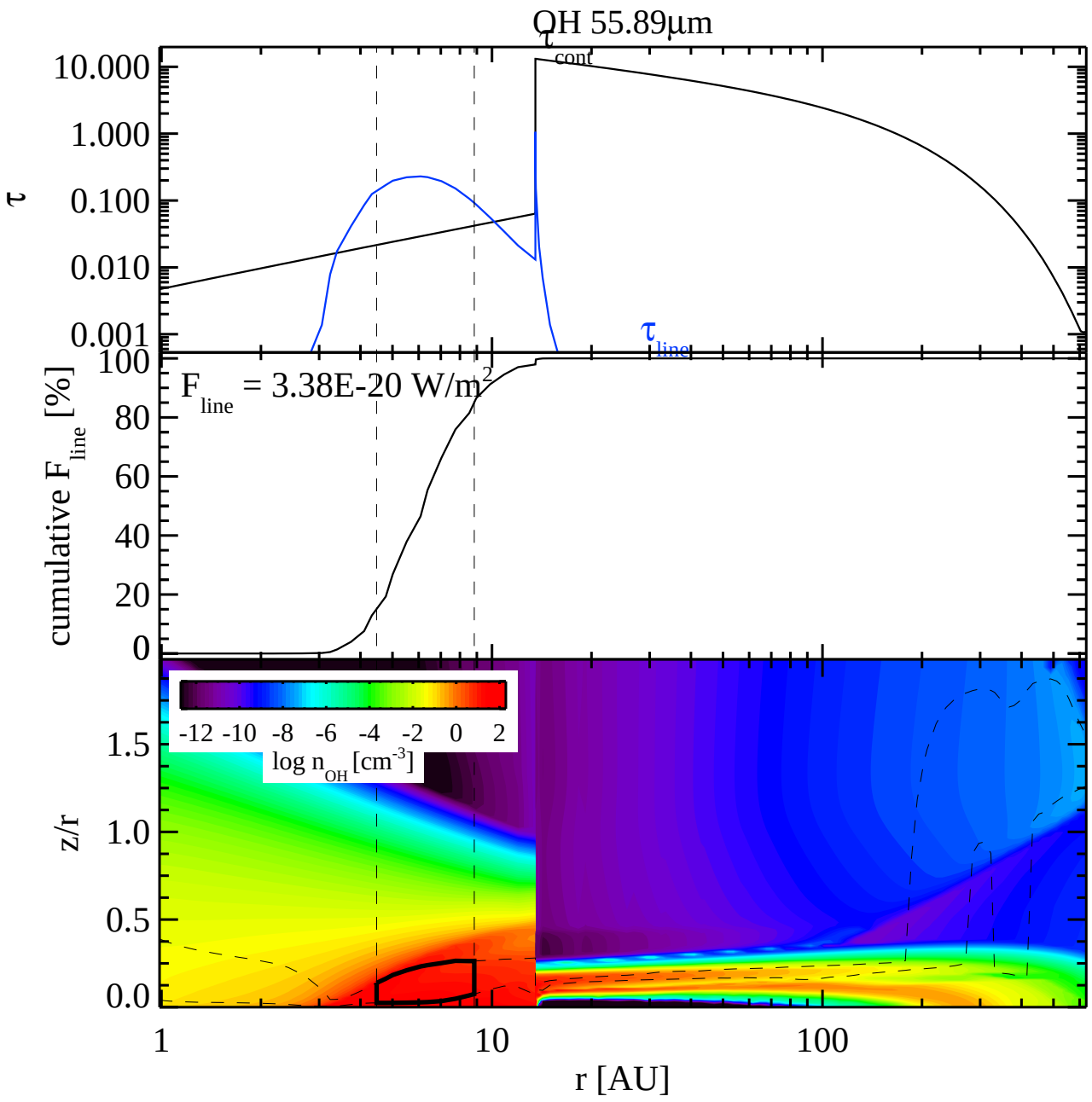

OH 119.23µm
τ
1000.000
100.000
10.000
1.000
0.100
0.010
0.001
τ line
τ cont
cumulative F line [%]
100
80
60
40
20
0
F line = 1.71E-18 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

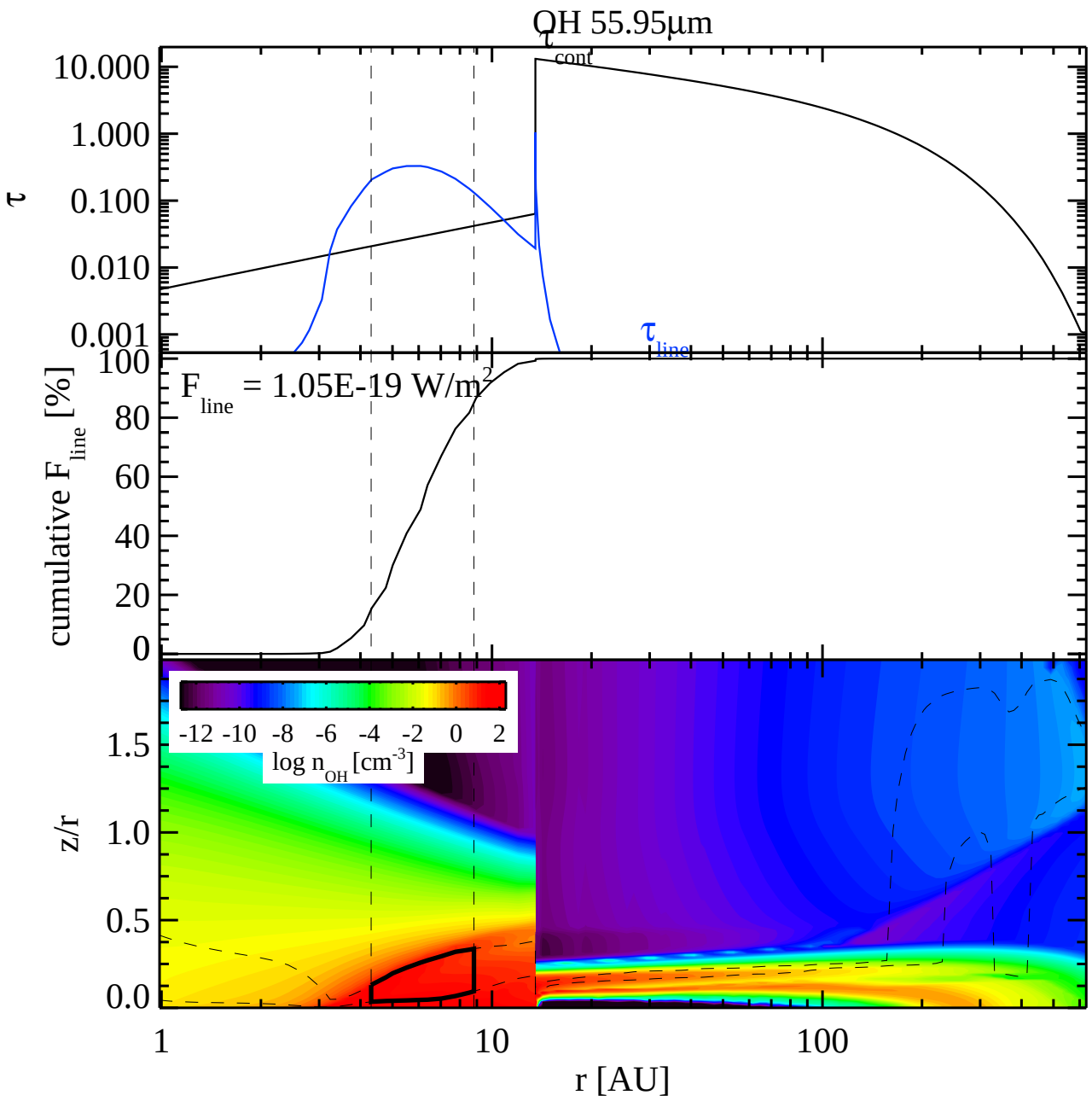

OH 79.18µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.22E-18 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

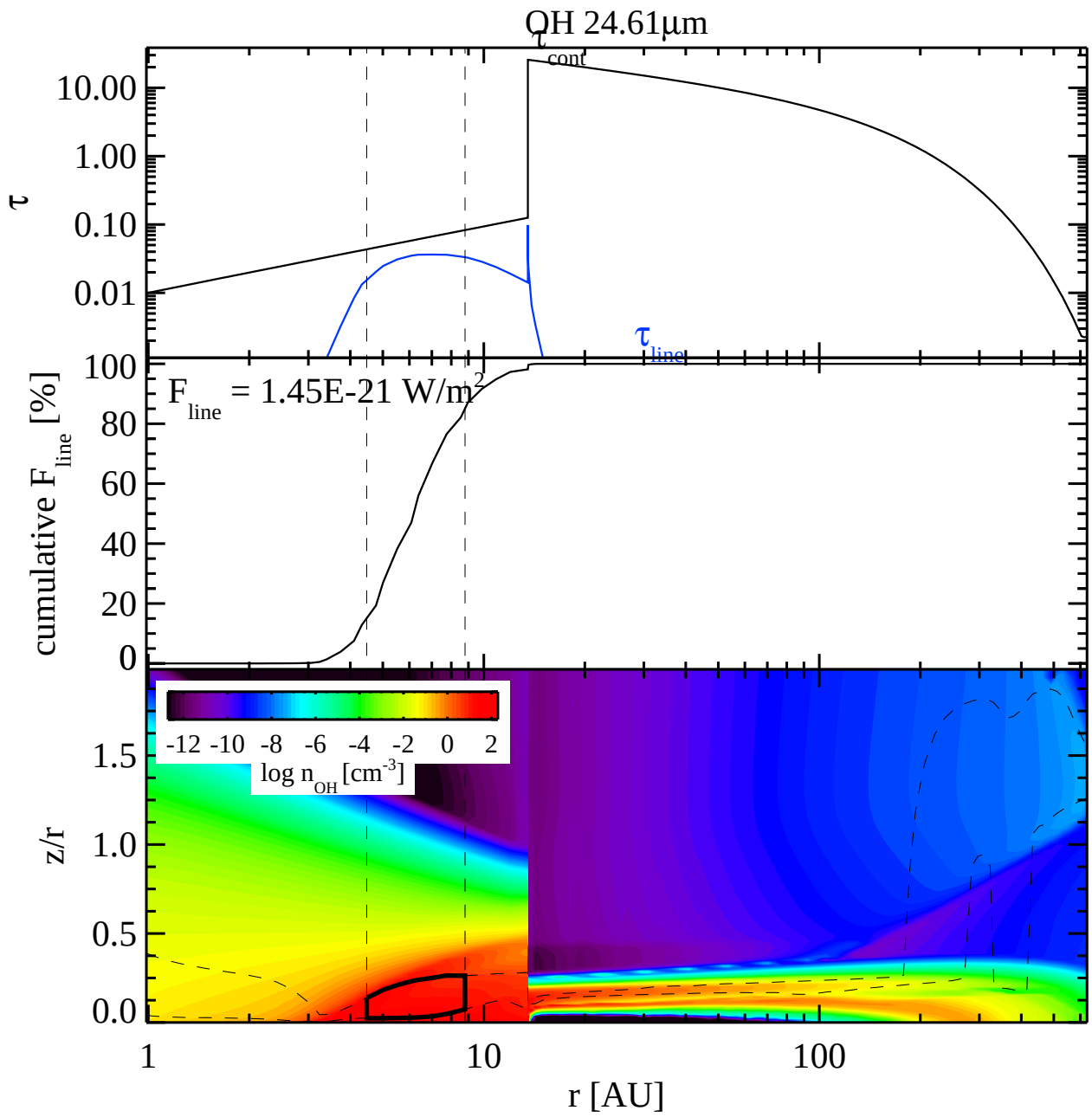

OH 79.12µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.19E-18 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

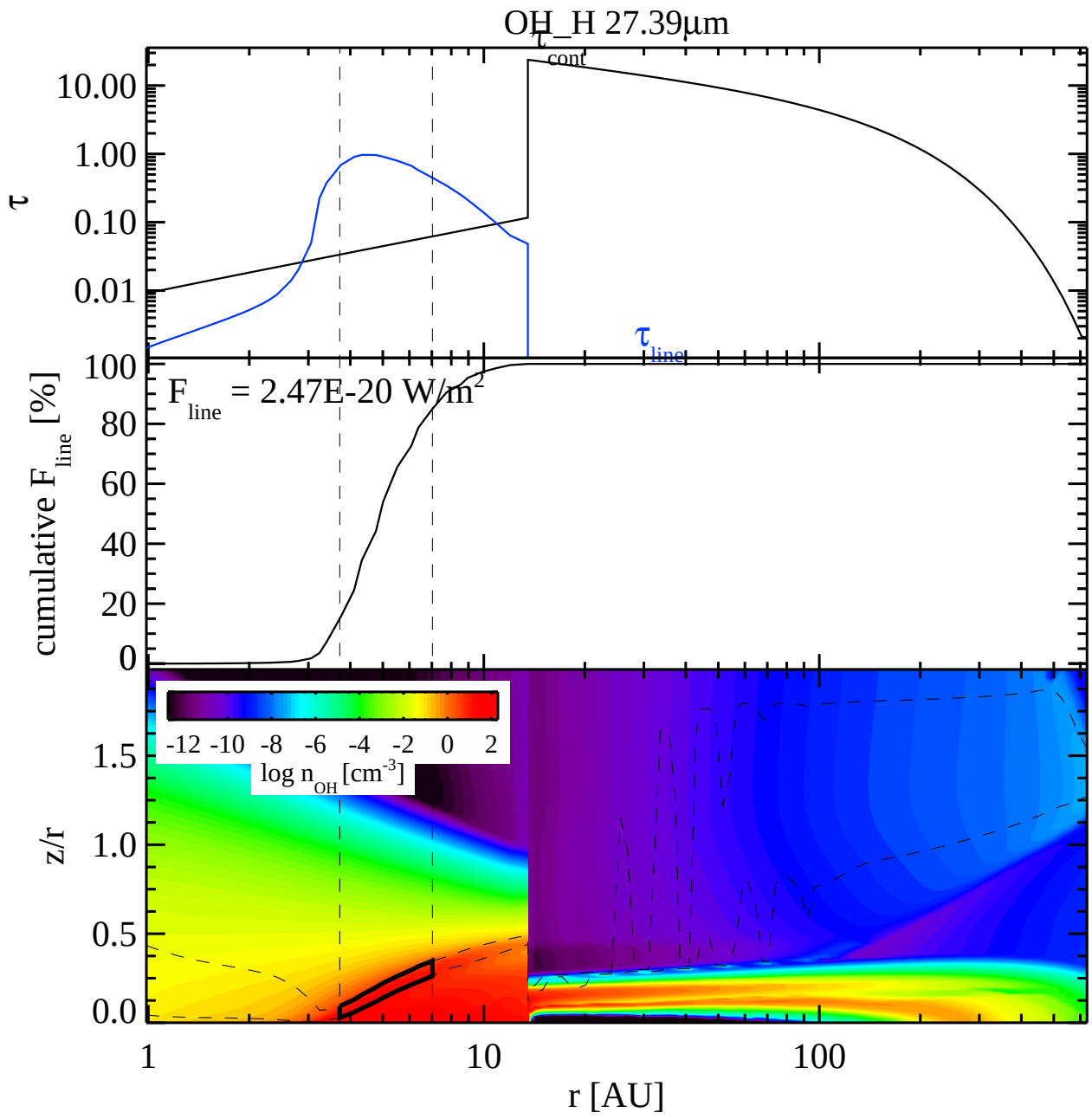

OH 71.22µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 4.01E-19 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

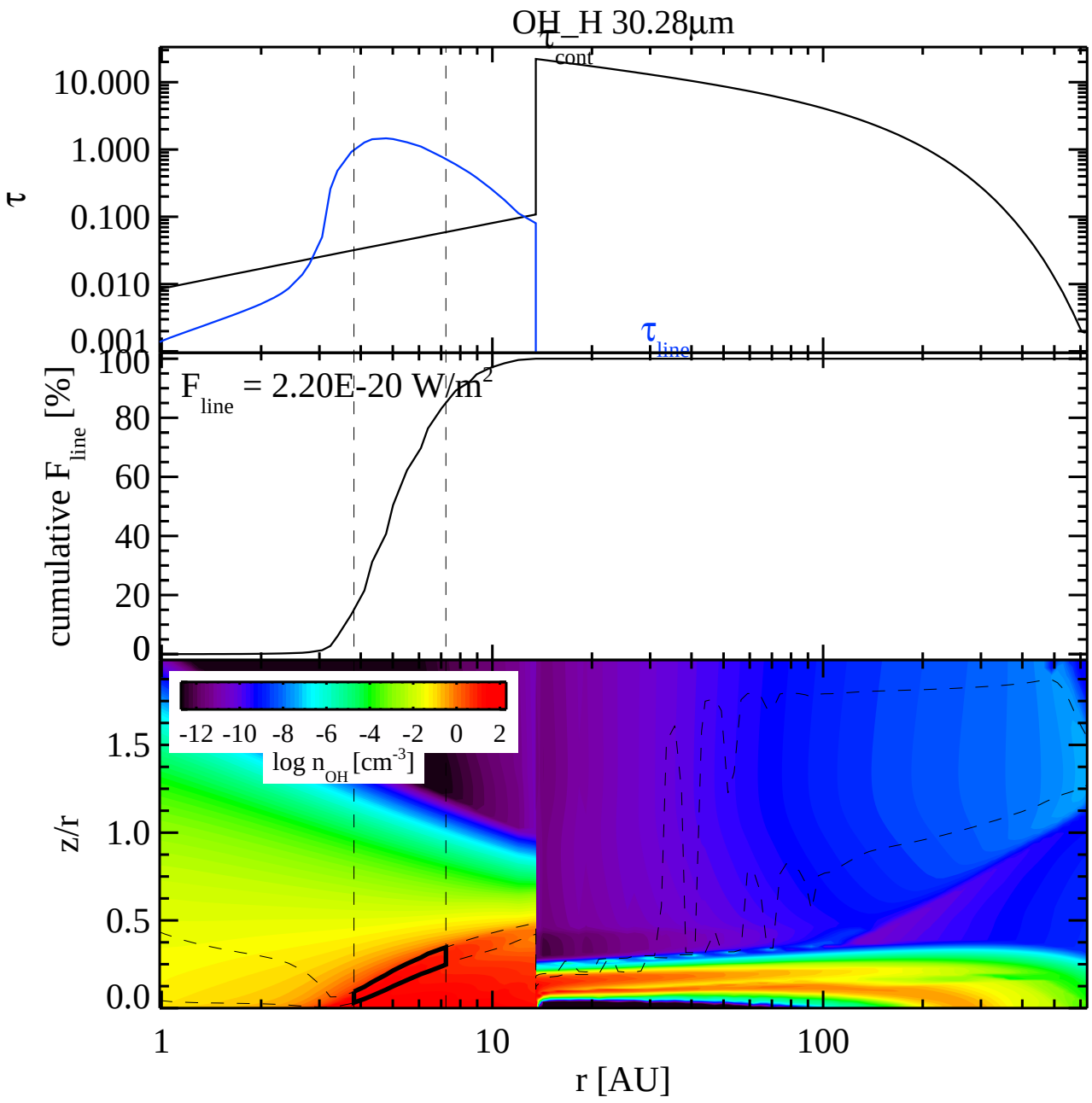

OH 71.17µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.57E-19 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

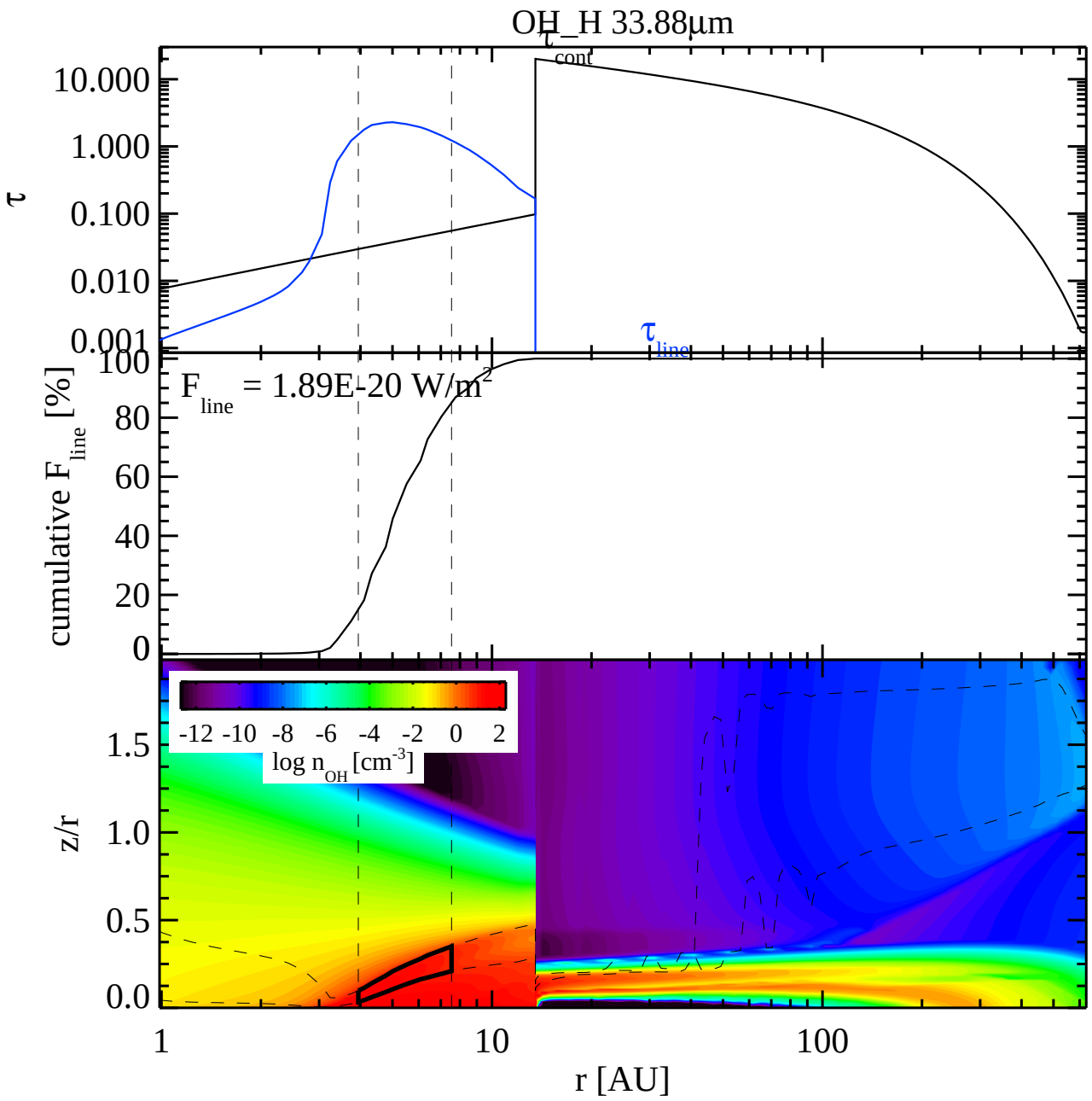

OH 55.89µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.38E-20 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

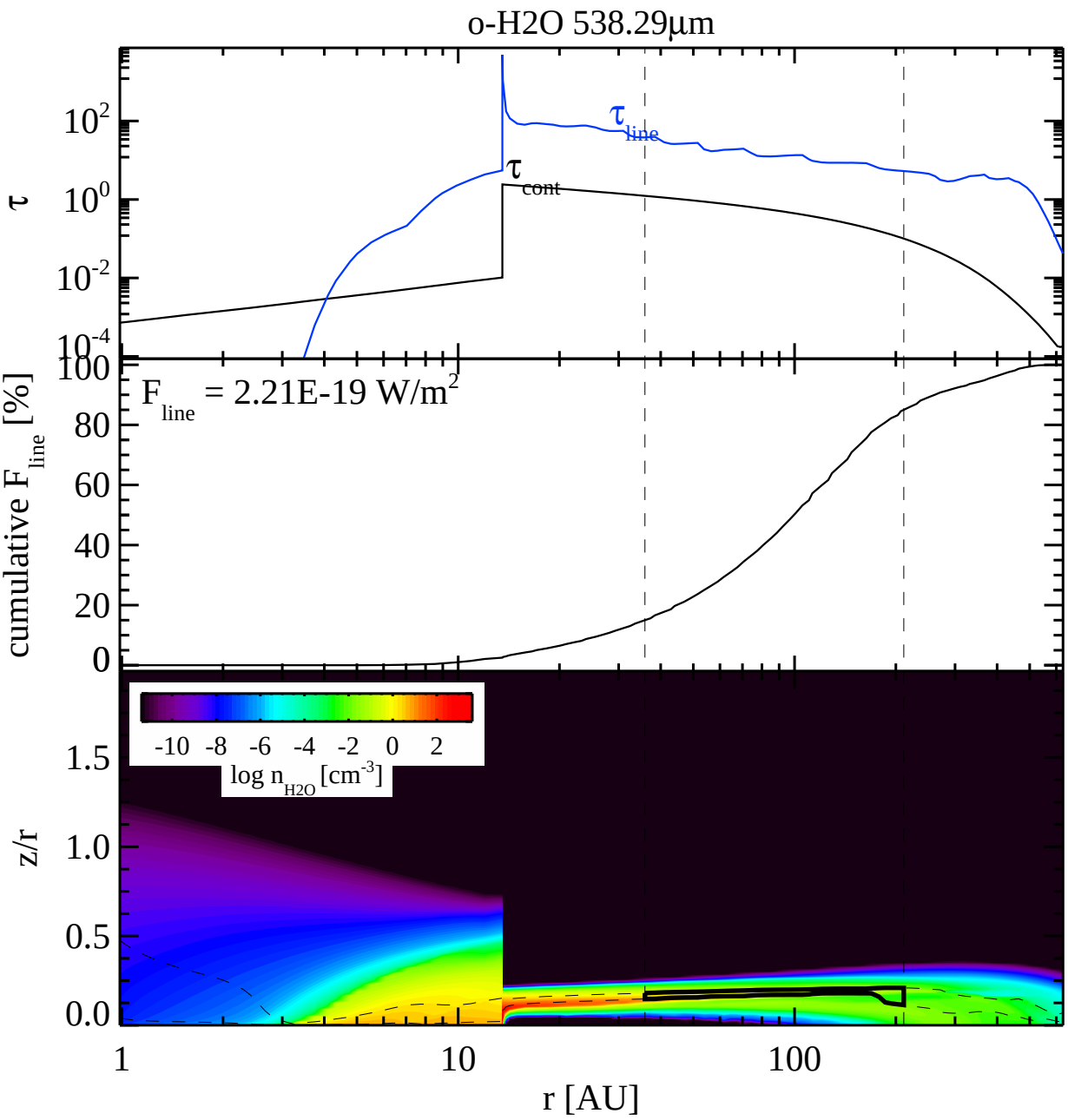

OH 55.95µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.05E-19 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

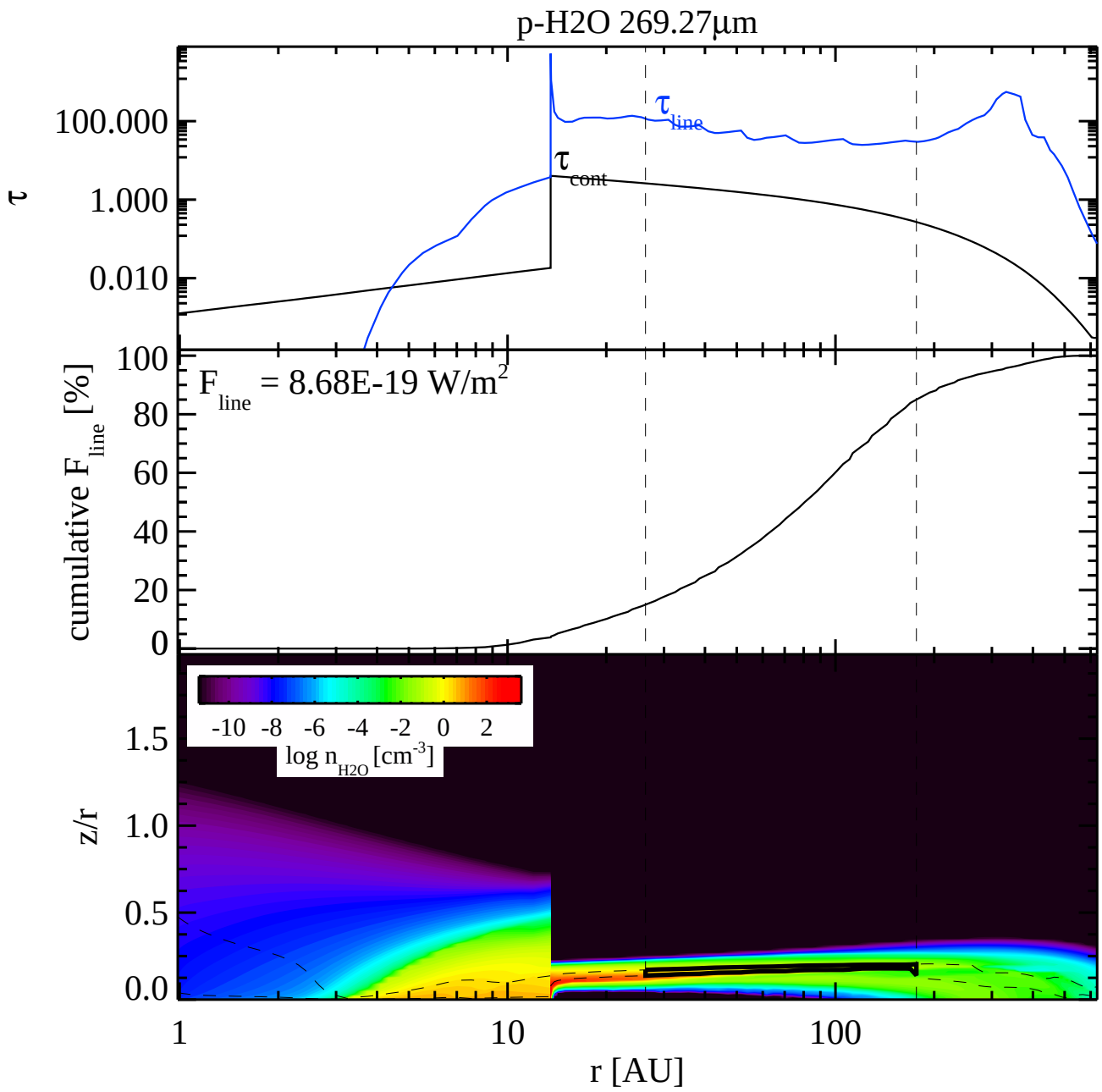

OH 24.61µm
τ
cont
τ
line
10.00
1.00
0.10
0.01
τ
100
80
60
40
20
0
cumulative F
line
[%]
F
line
= 1.45E-21 W/m
2
-12 -10 -8 -6 -4 -2 0 2
log n
OH
[cm
-3
]
1.5
1.0
0.5
0.0
z/r
1
10
100
r [AU]

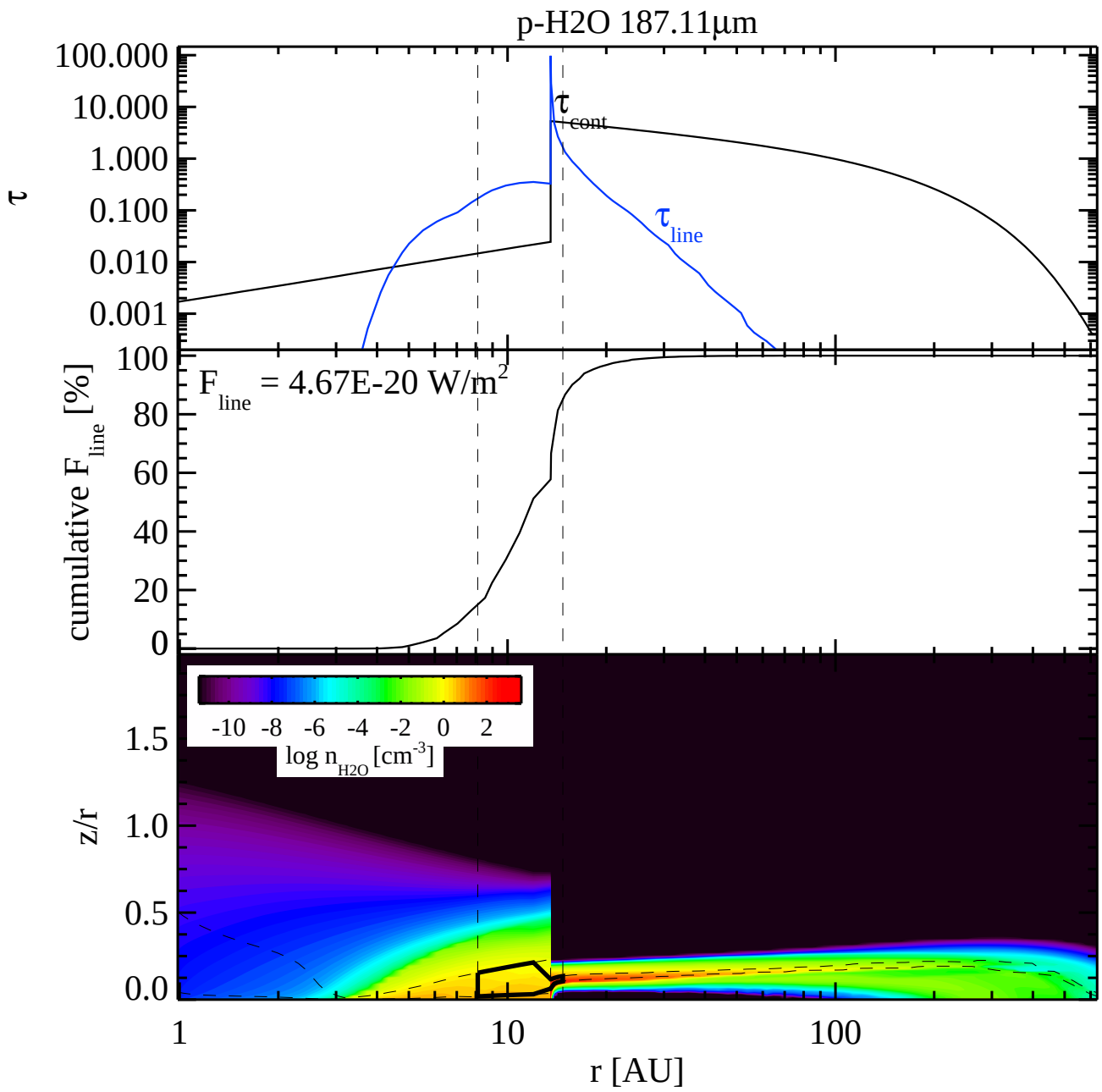

OH_H 27.39µm
τ
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.47E-20 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

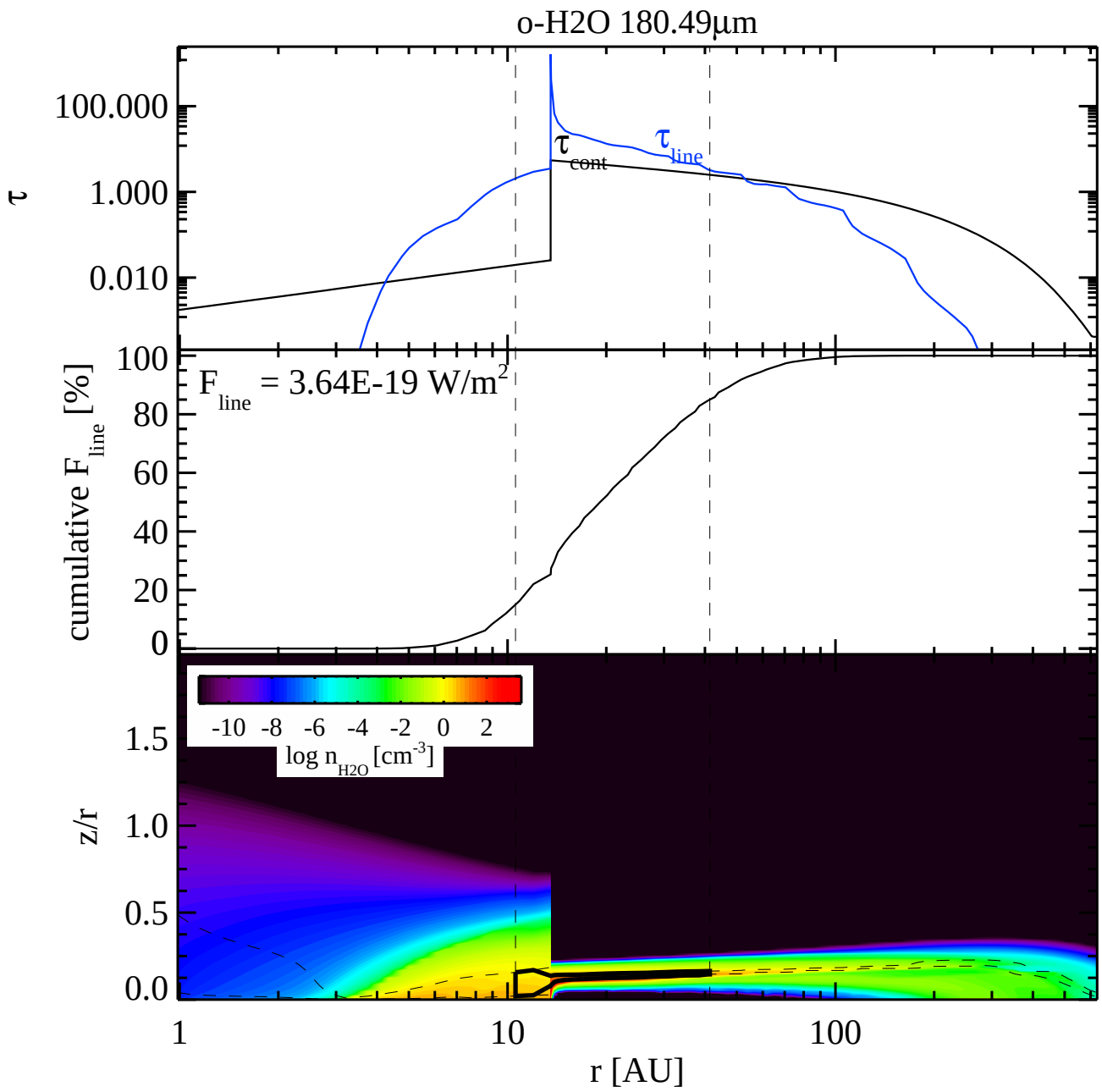

OH_H 30.28µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.20E-20 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

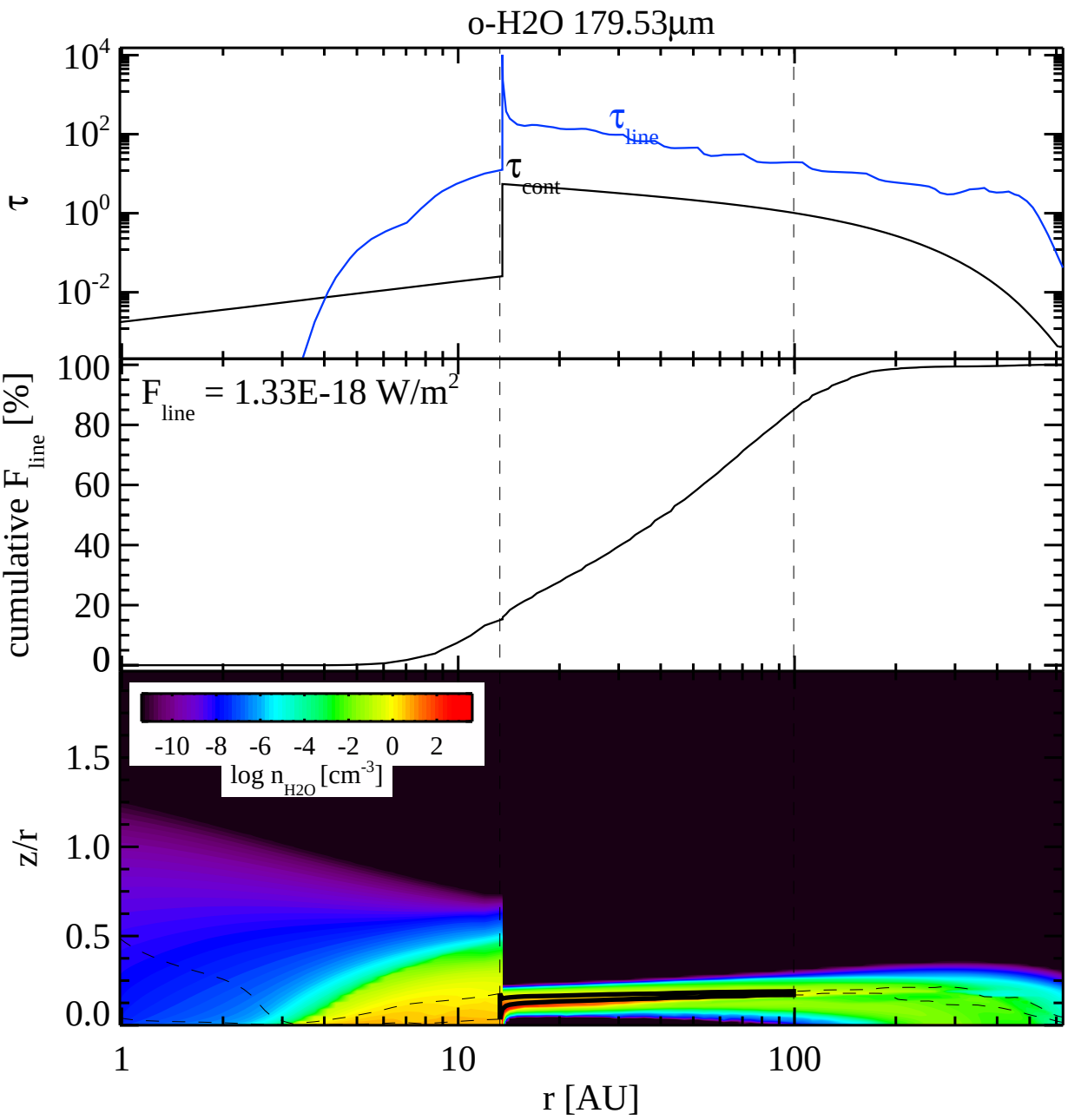

OH_H 33.88µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.89E-20 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n OH [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

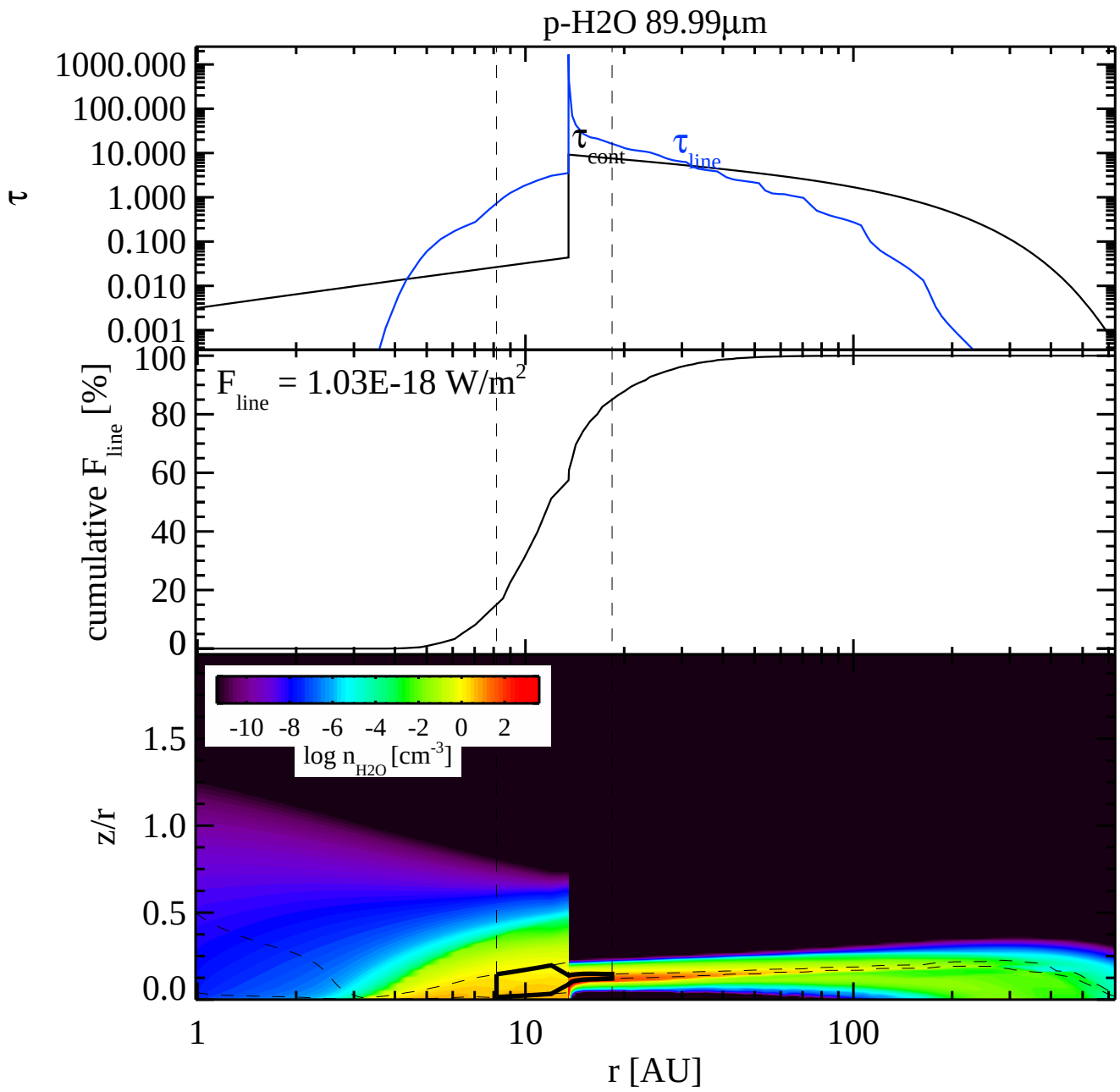

o-H2O 538.29µm
τ
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.21E-19 W/m^2
-10 -8 -6 -4 -2 0 2
log n_{H2O} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

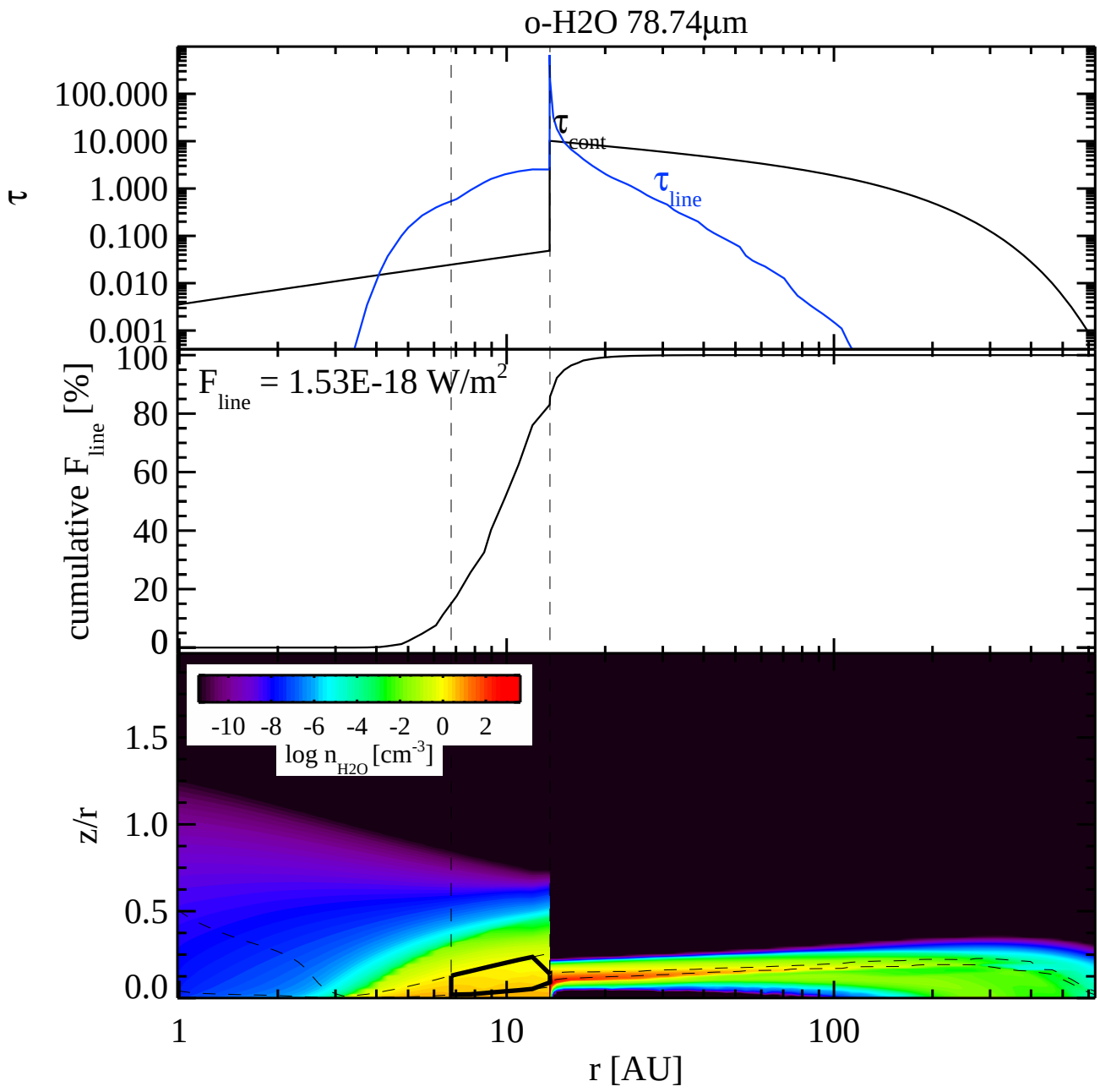

p-H2O 269.27µm
τ
100.000
1.000
0.010
τ line
τ cont
100
80
60
40
20
0
cumulative F line [%]
F line = 8.68E-19 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
1.5
1.0
0.5
0.0
z/r
1
10
100
r [AU]

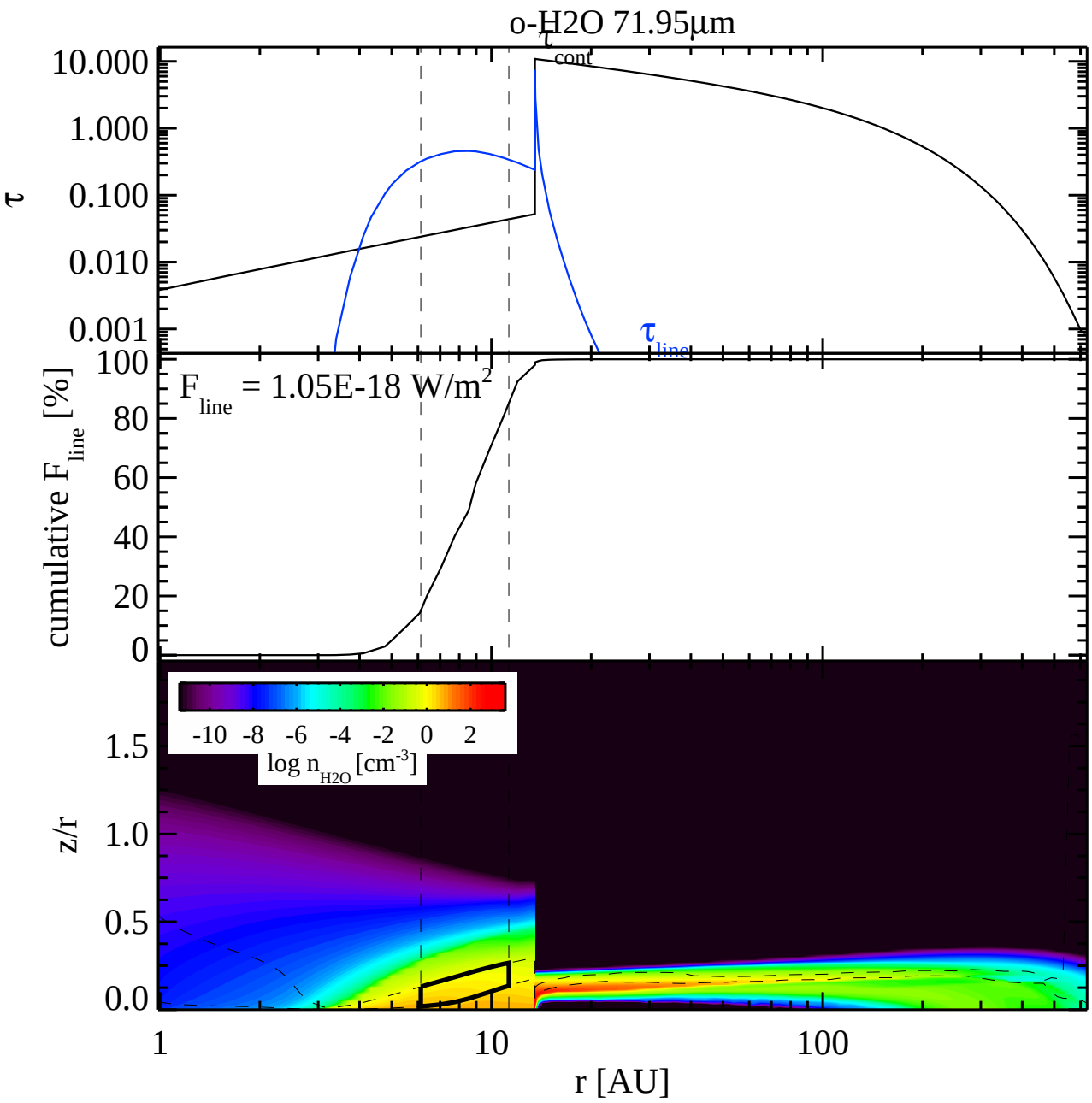

p-H2O 187.11µm
100.000
10.000
1.000
0.100
0.010
0.001
τ
τ cont
τ line
100
80
60
40
20
0
cumulative F line [%]
F line = 4.67E-20 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
1.5
1.0
0.5
0.0
z/r
1
10
100
r [AU]

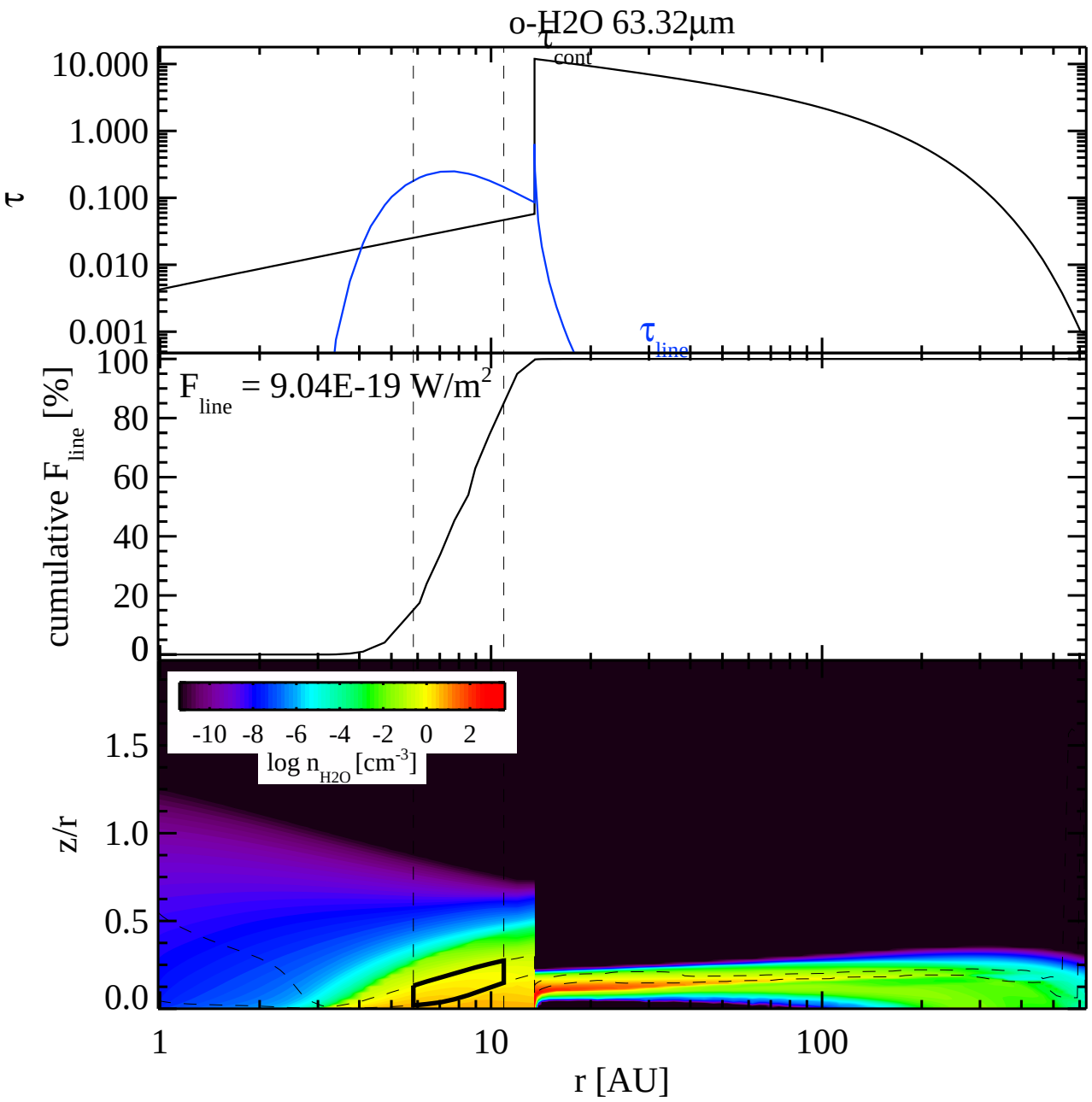

o-H2O 180.49µm
τ
100.000
1.000
0.010
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.64E-19 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

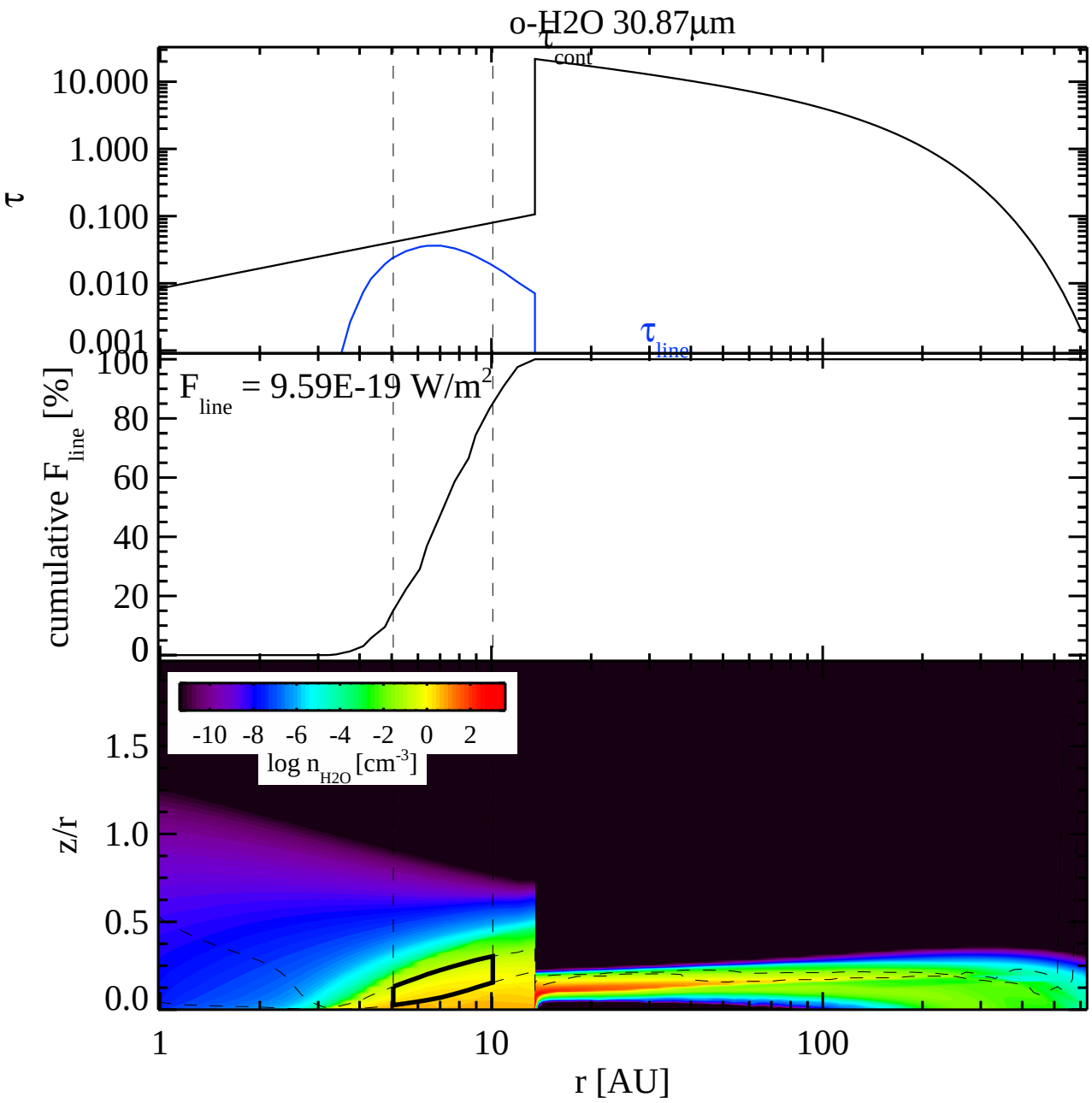

o-H2O 179.53µm
τ
τ line
τ cont
cumulative F line [%]
F line = 1.33E-18 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
r [AU]

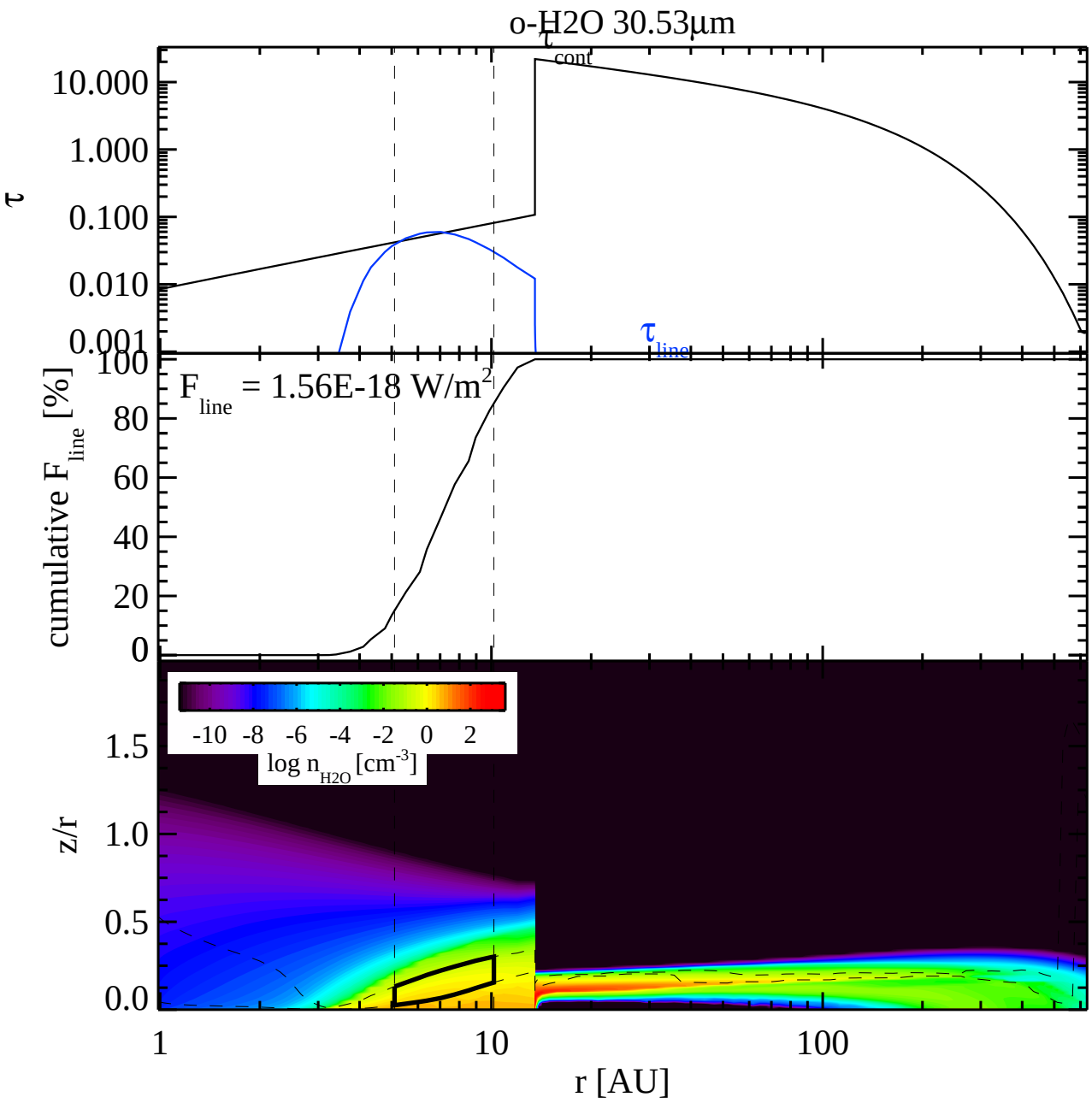

p-H2O 89.99µm
τ
1000.000
100.000
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.03E-18 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

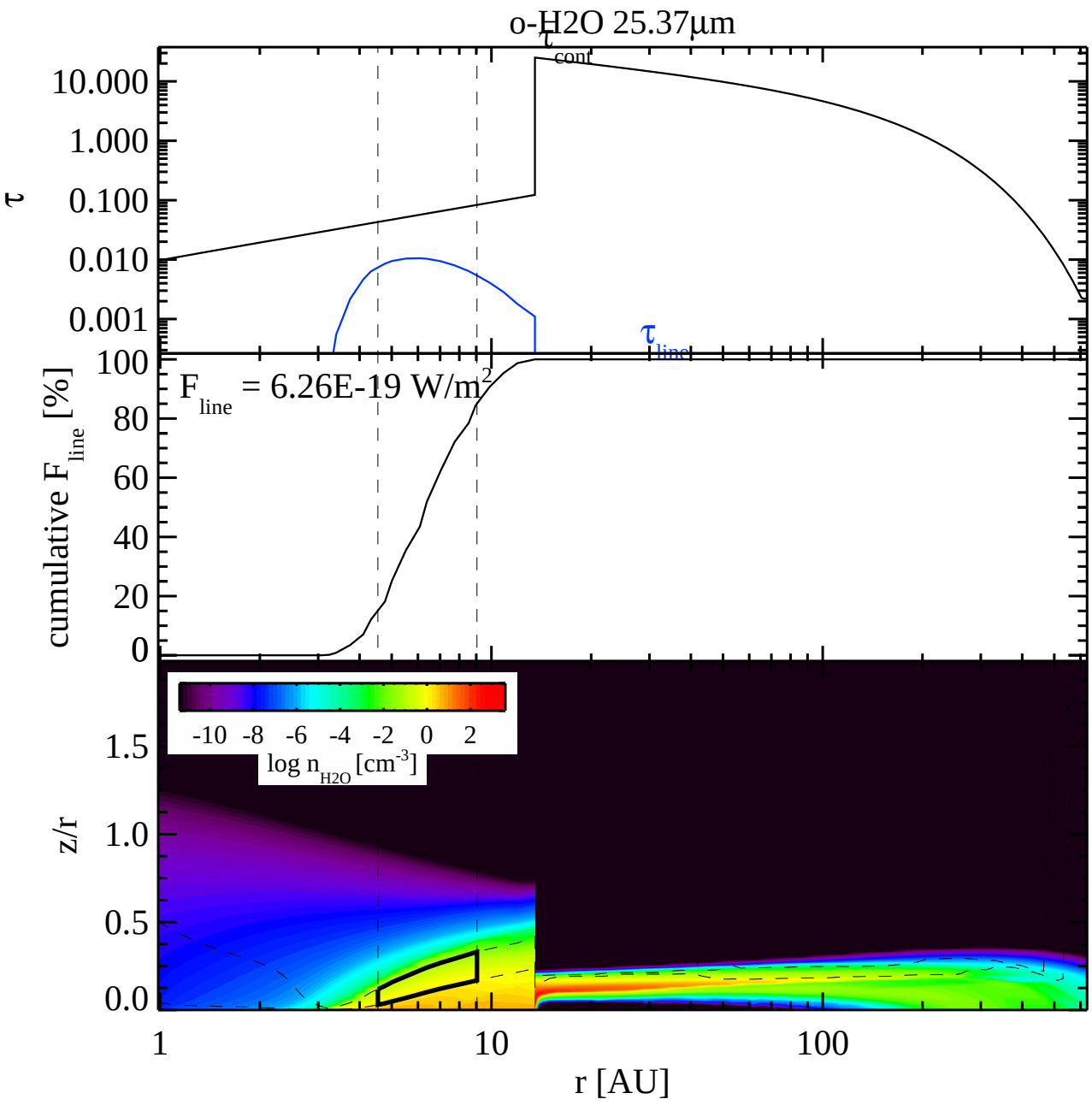

o-H2O 78.74µm
τ
100.000
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.53E-18 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

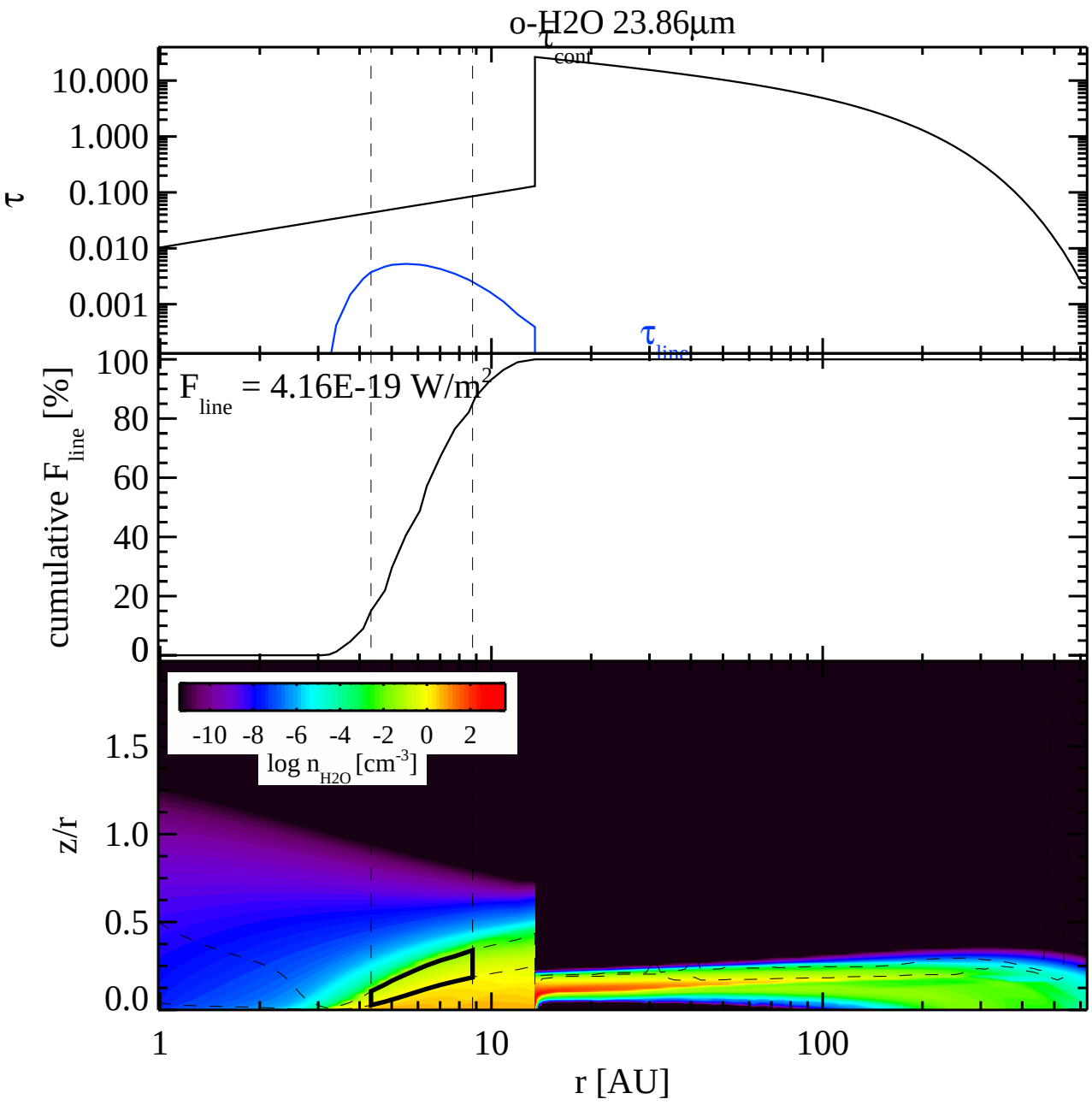

o-H2O 71.95µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.05E-18 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

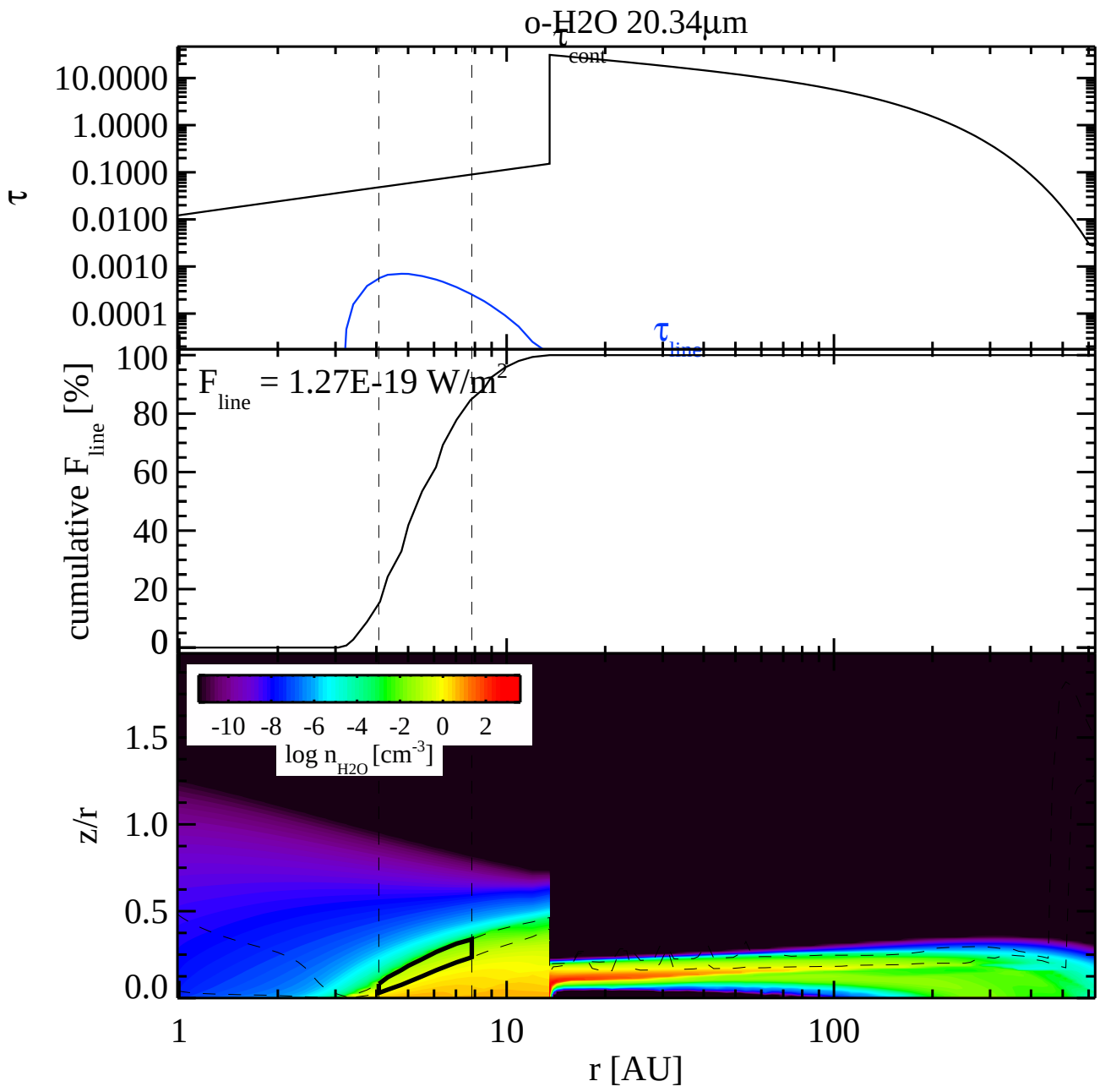

o-H2O 63.32µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 9.04E-19 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

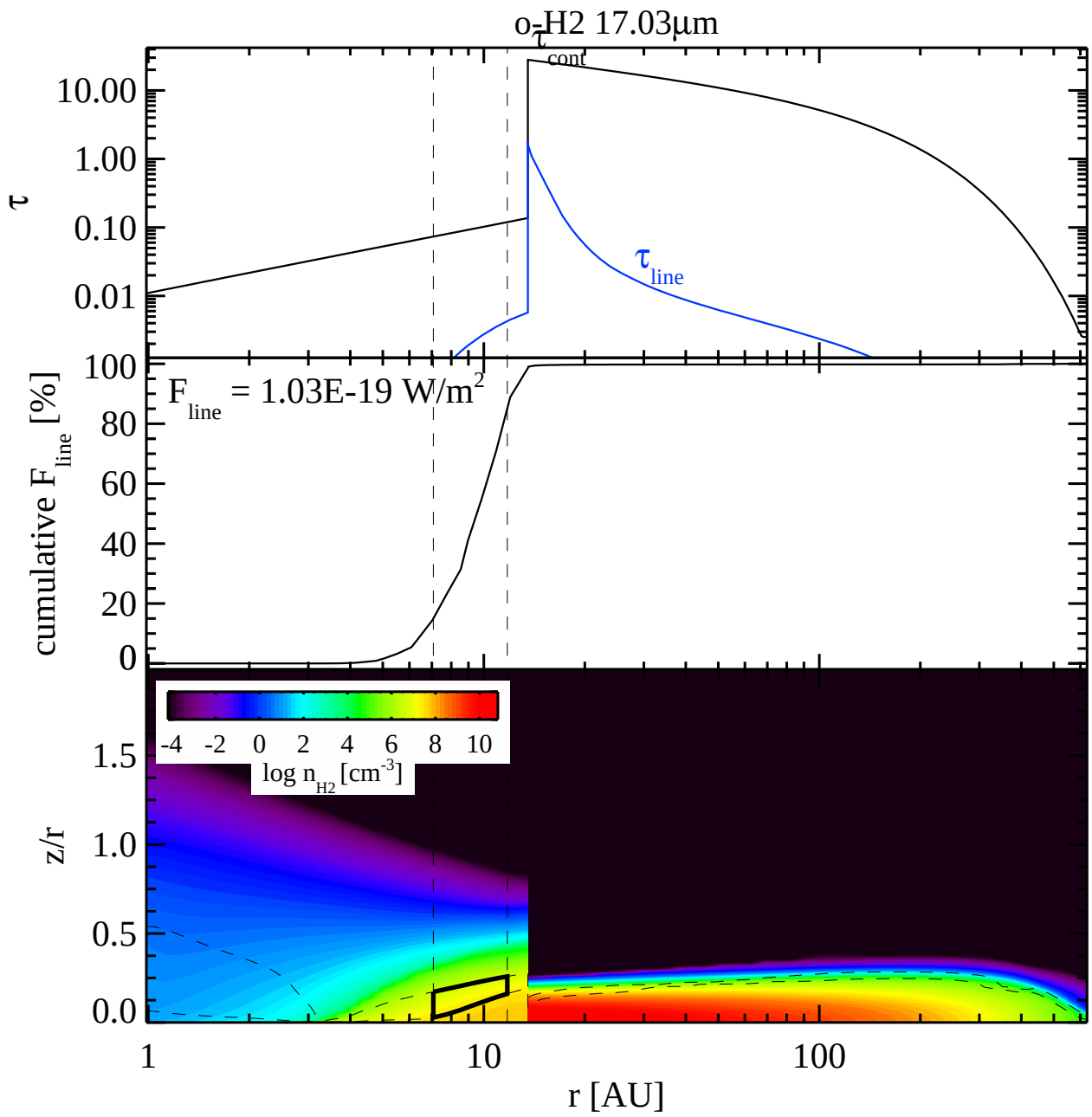

o-H2O 30.87µm
τ
τ cont
τ line
10.000
1.000
0.100
0.010
0.001
cumulative F line [%]
F line = 9.59E-19 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

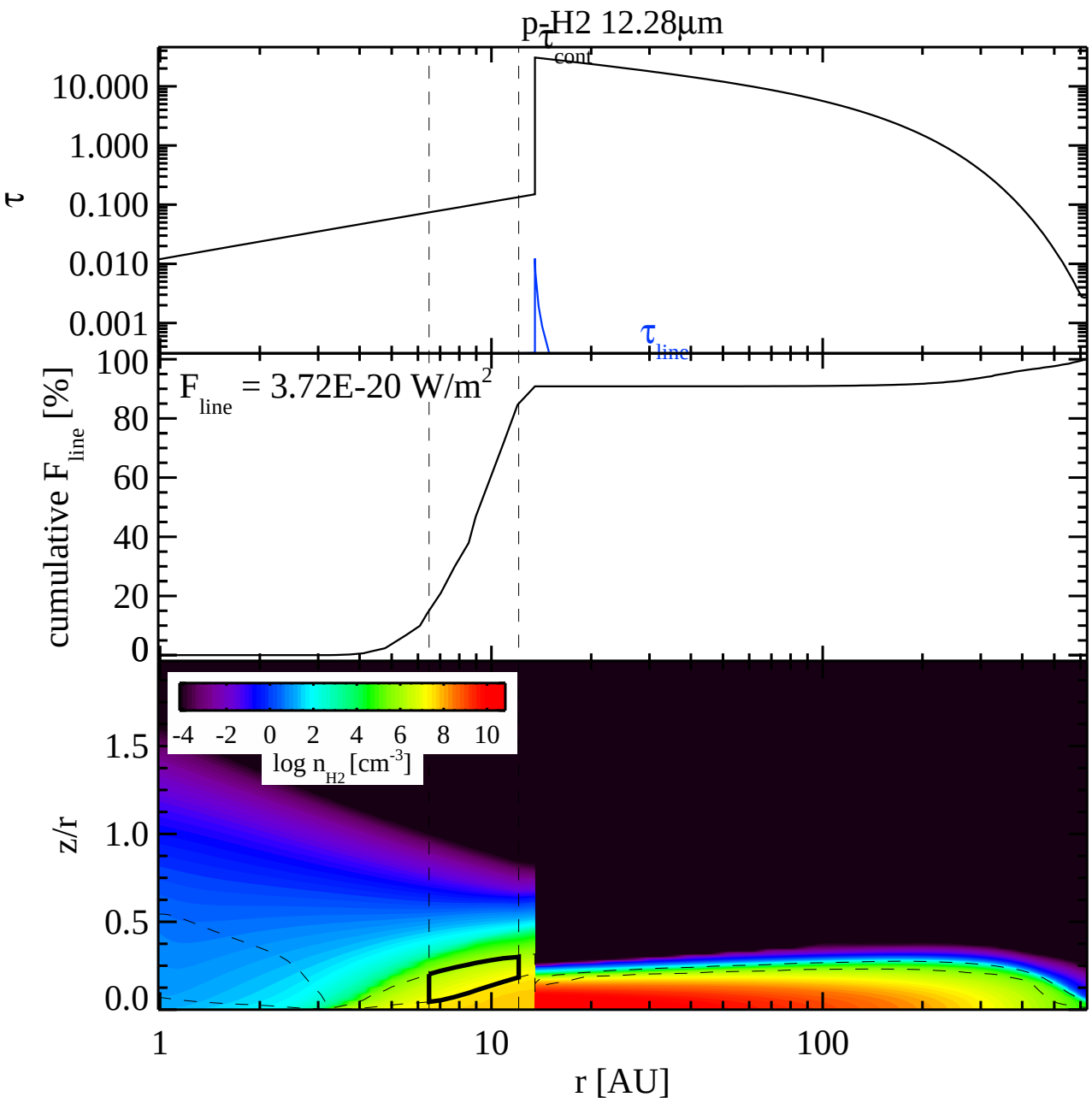

o-H2O 30.53µm
τ
τ cont
τ line
10.000
1.000
0.100
0.010
0.001
cumulative F line [%]
F line = 1.56E-18 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

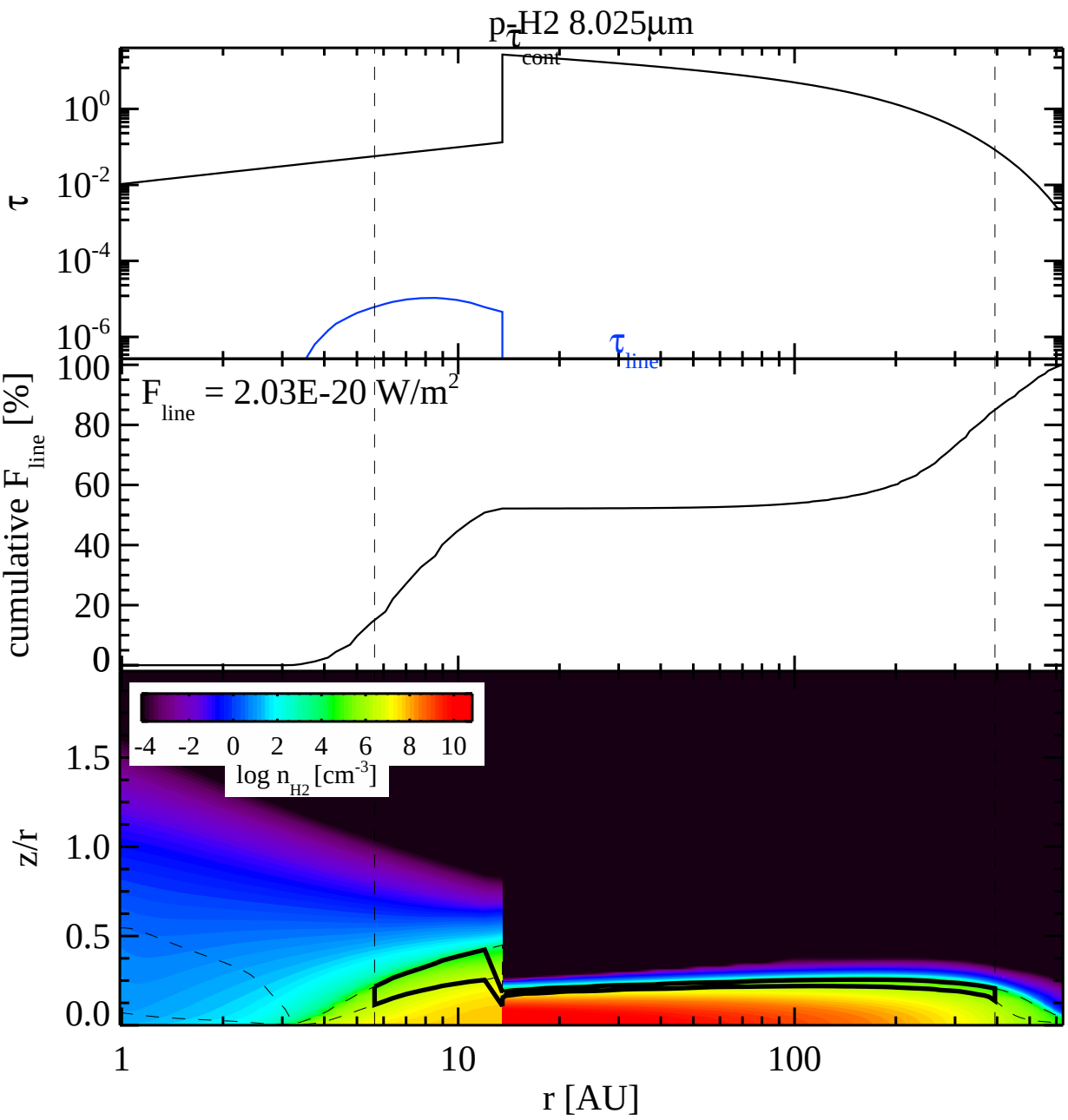

o-H2O 25.37µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 6.26E-19 W/m2
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

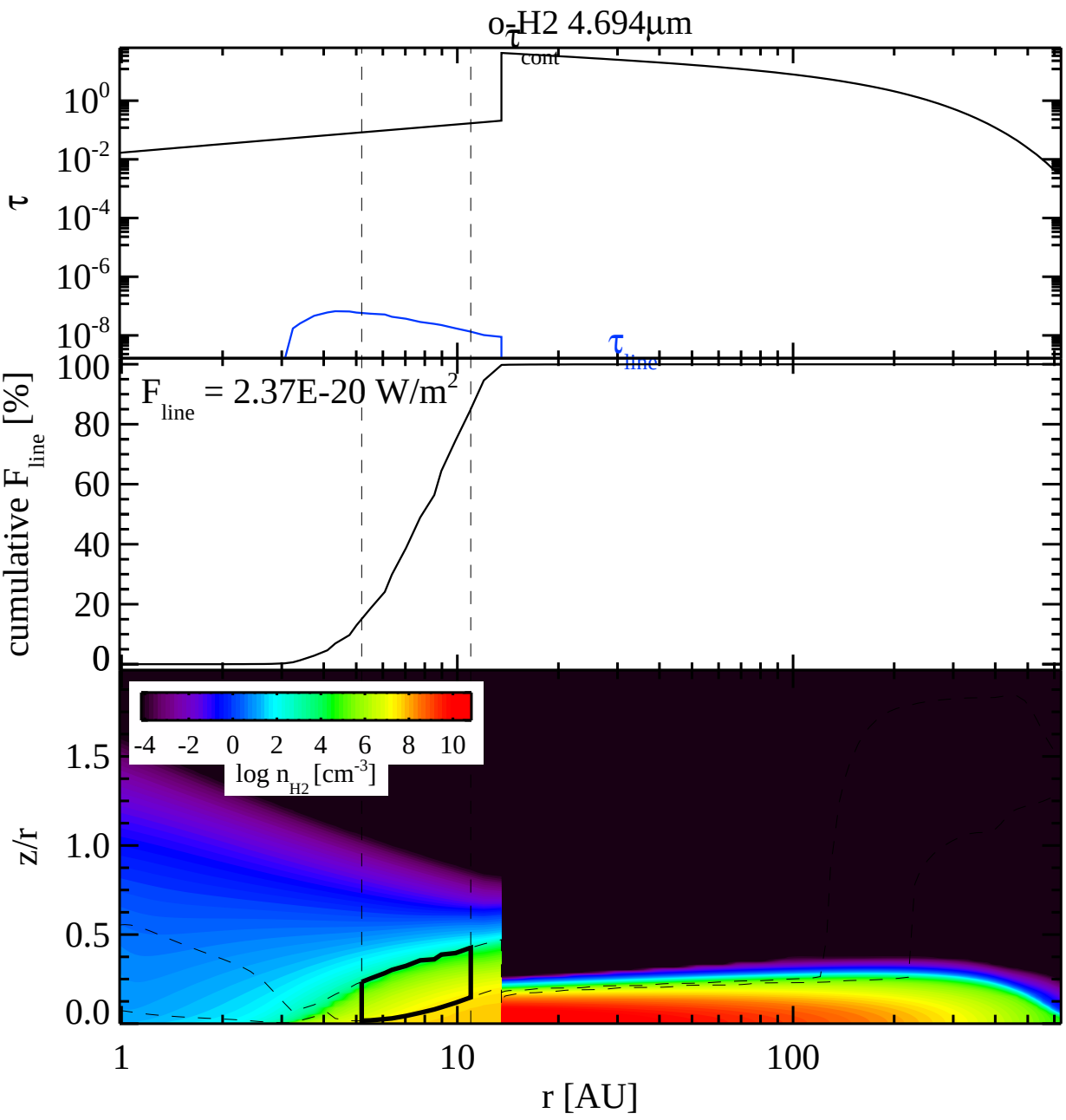

o-H2O 23.86µm
τ
τ cont
τ line
10.000
1.000
0.100
0.010
0.001
cumulative F line [%]
F line = 4.16E-19 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

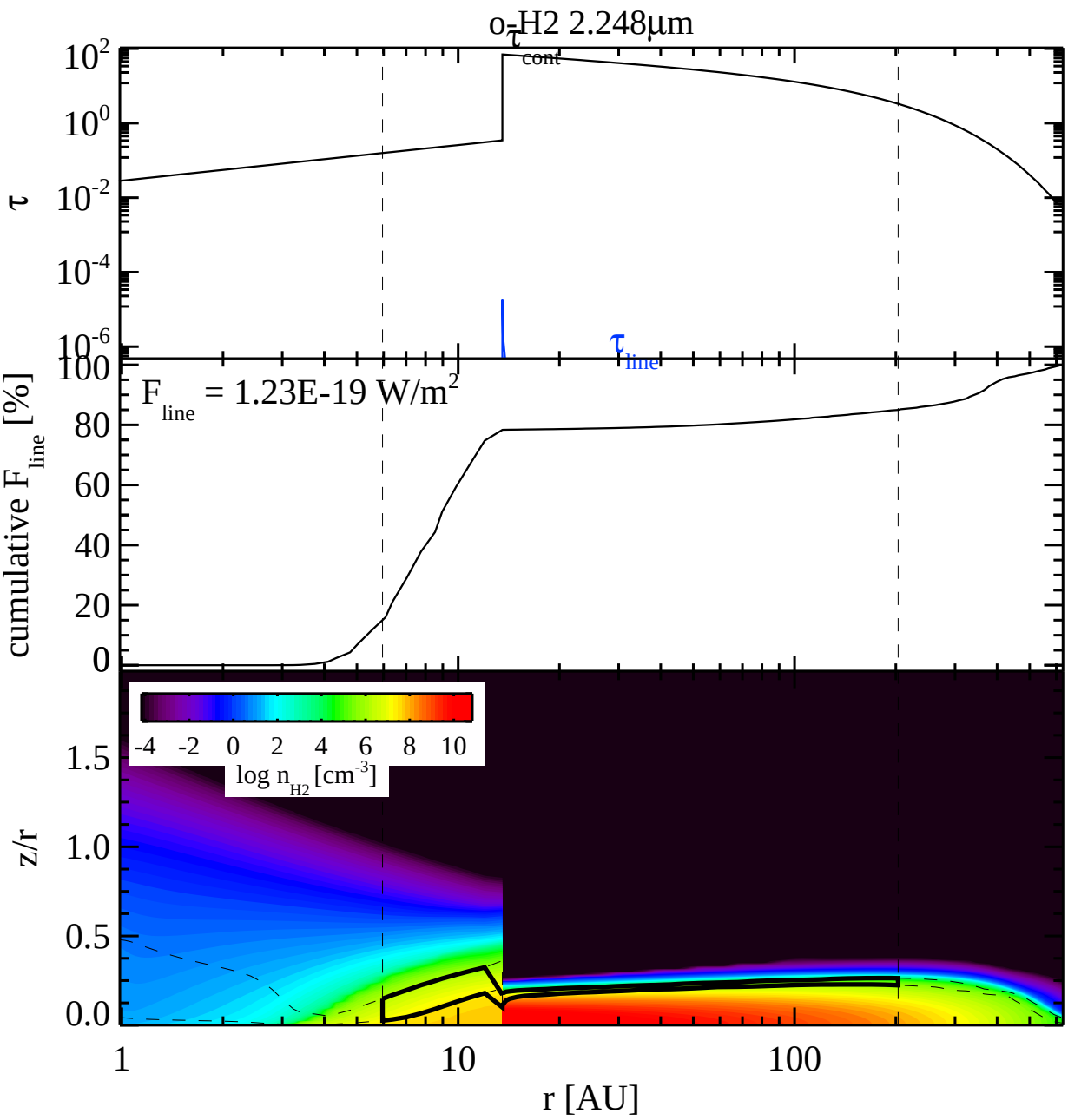

o-H2O 20.34µm
τ
τ cont
τ line
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
cumulative F line [%]
F line = 1.27E-19 W/m2
100
80
60
40
20
0
-10 -8 -6 -4 -2 0 2
log n H2O [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

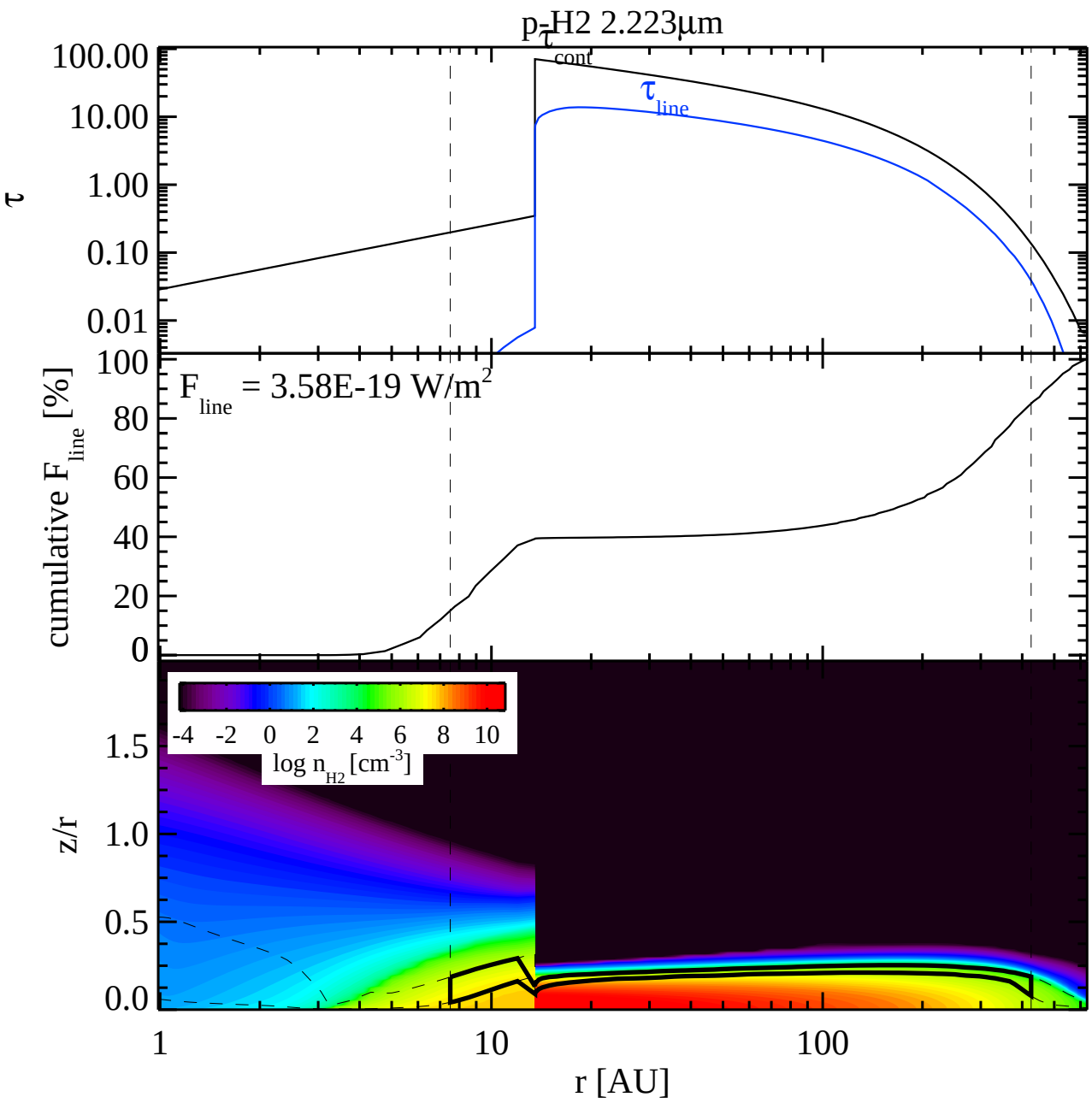

o-H2 17.03µm
τ
cont
τ
line
10.00
1.00
0.10
0.01
τ
F
line
= 1.03E-19 W/m
2
cumulative F
line
[%]
100
80
60
40
20
0
-4 -2 0 2 4 6 8 10
log n
H2
[cm
-3
]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

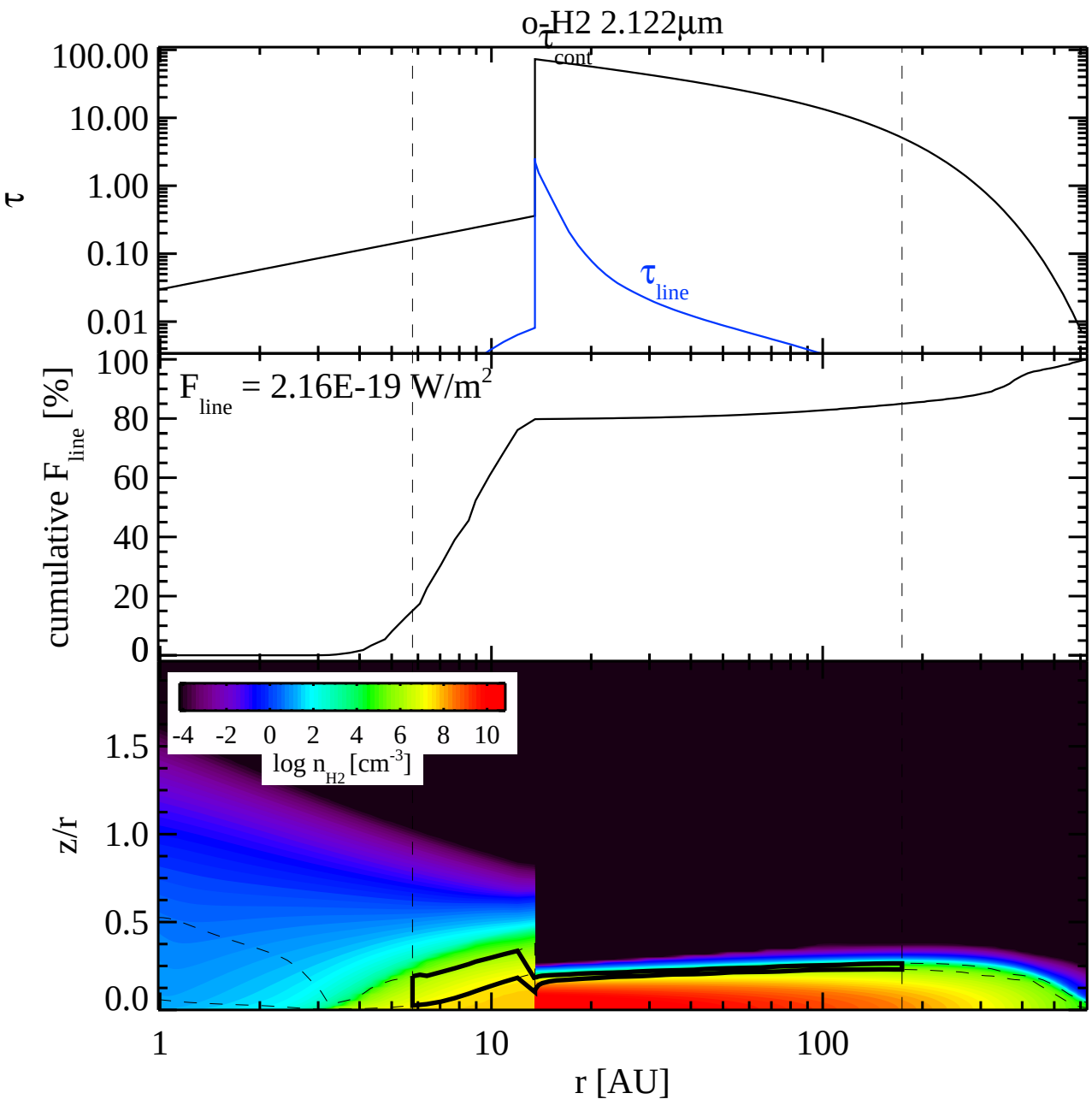

p-H2 12.28µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.72E-20 W/m2
-4 -2 0 2 4 6 8 10
log n H2 [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

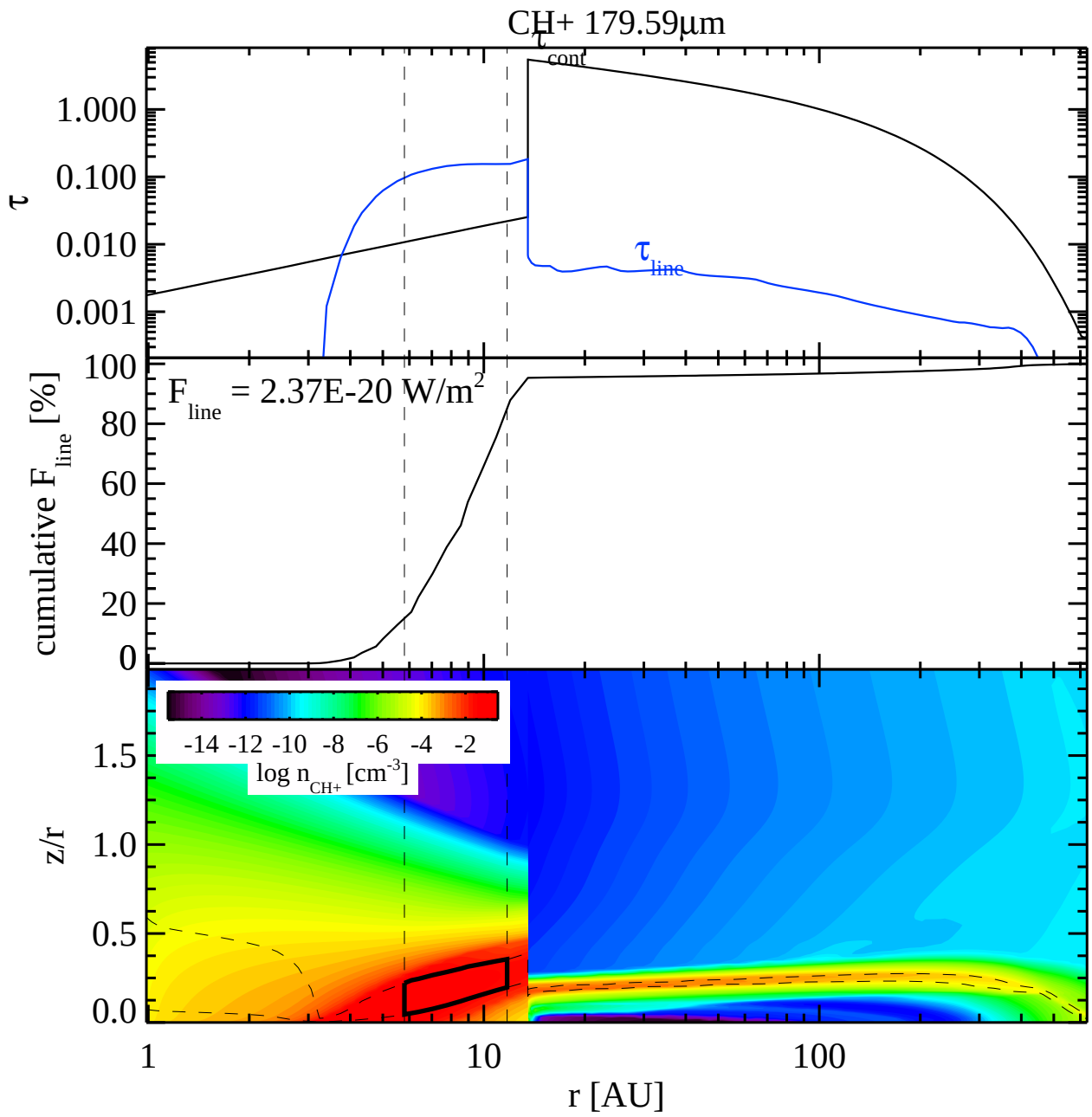

p-H2 8.025µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
cumulative F line [%]
F line = 2.03E-20 W/m^2
100
80
60
40
20
0
z/r
1.5
1.0
0.5
0.0
-4 -2 0 2 4 6 8 10
log n H2 [cm^-3]
1
10
100
r [AU]

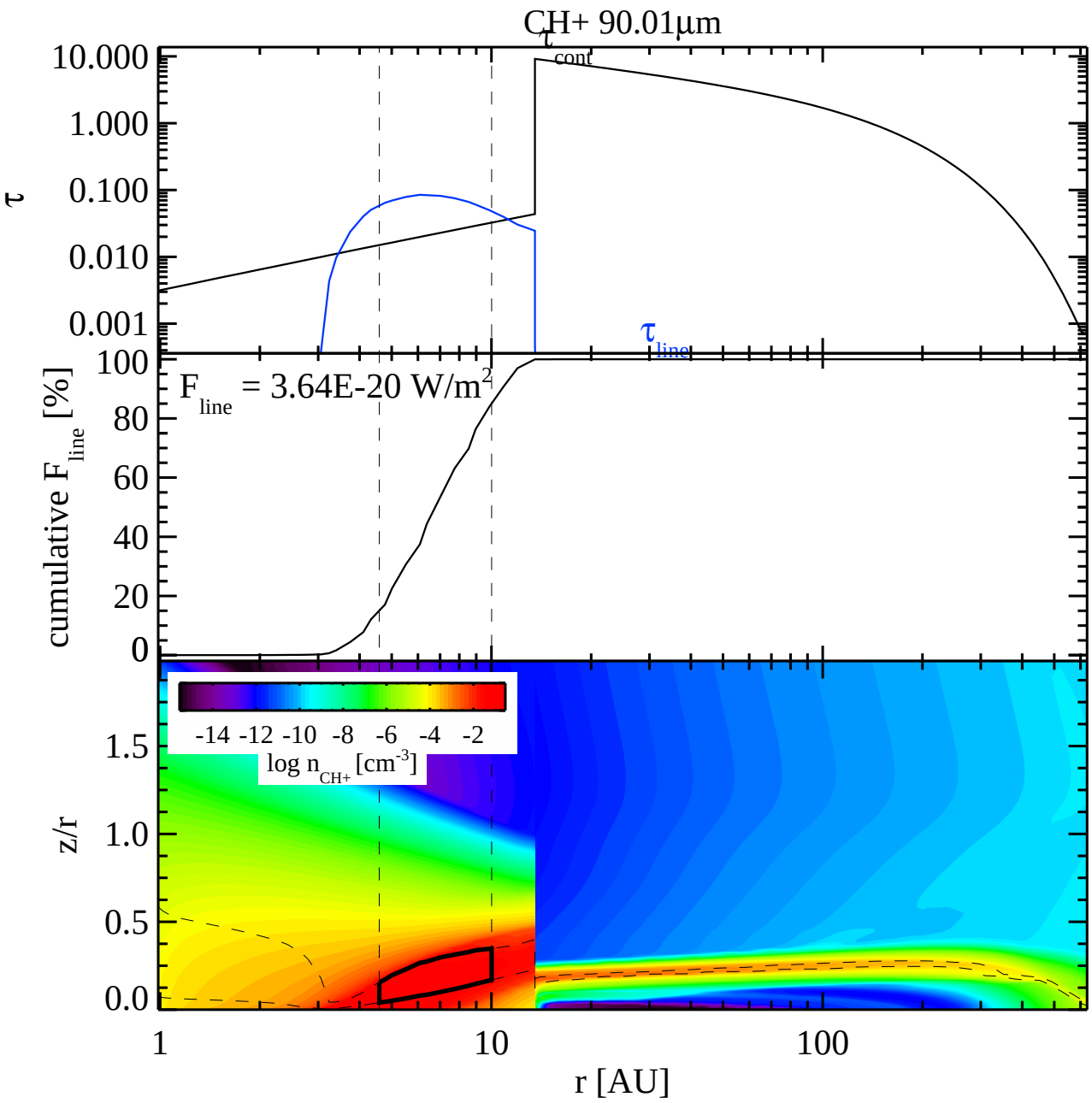

o-H2 4.694µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.37E-20 W/m2
log n H2 [cm-3]
z/r
r [AU]

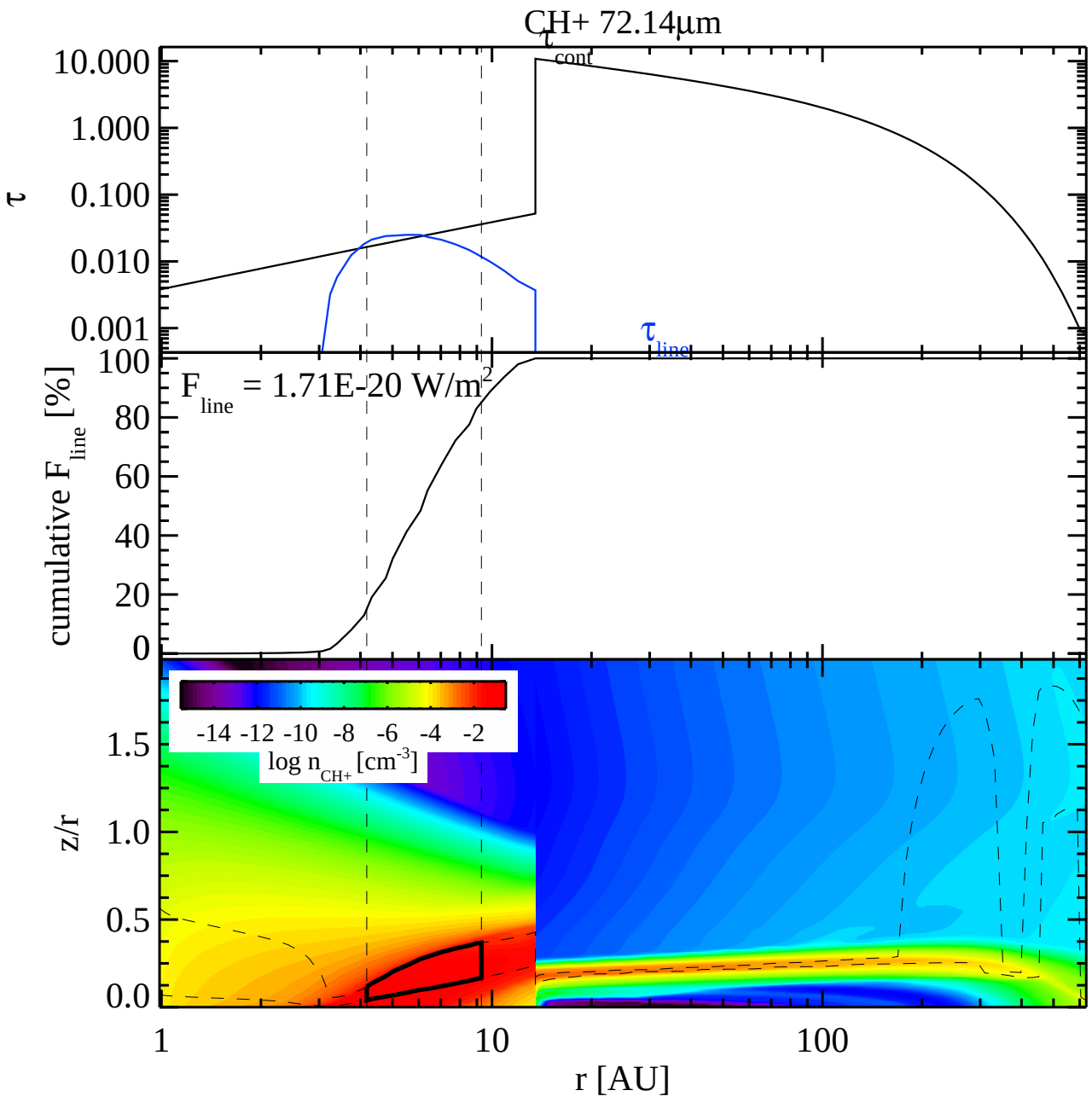

o-H2 2.248µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.23E-19 W/m2
log n H2 [cm-3]
-4 -2 0 2 4 6 8 10
z/r
r [AU]

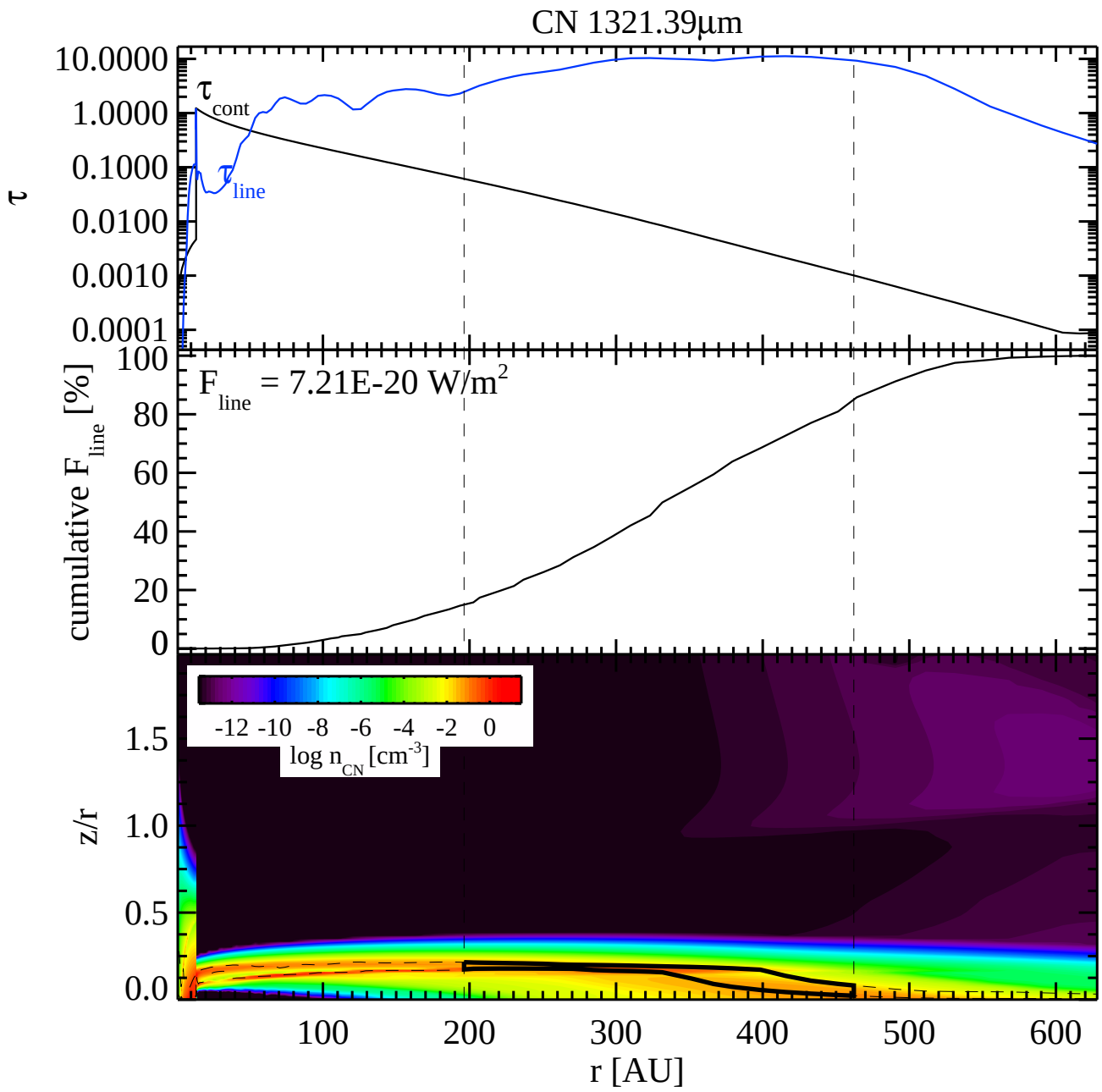

p-H2 2.223µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.58E-19 W/m2
-4 -2 0 2 4 6 8 10
log n H2 [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

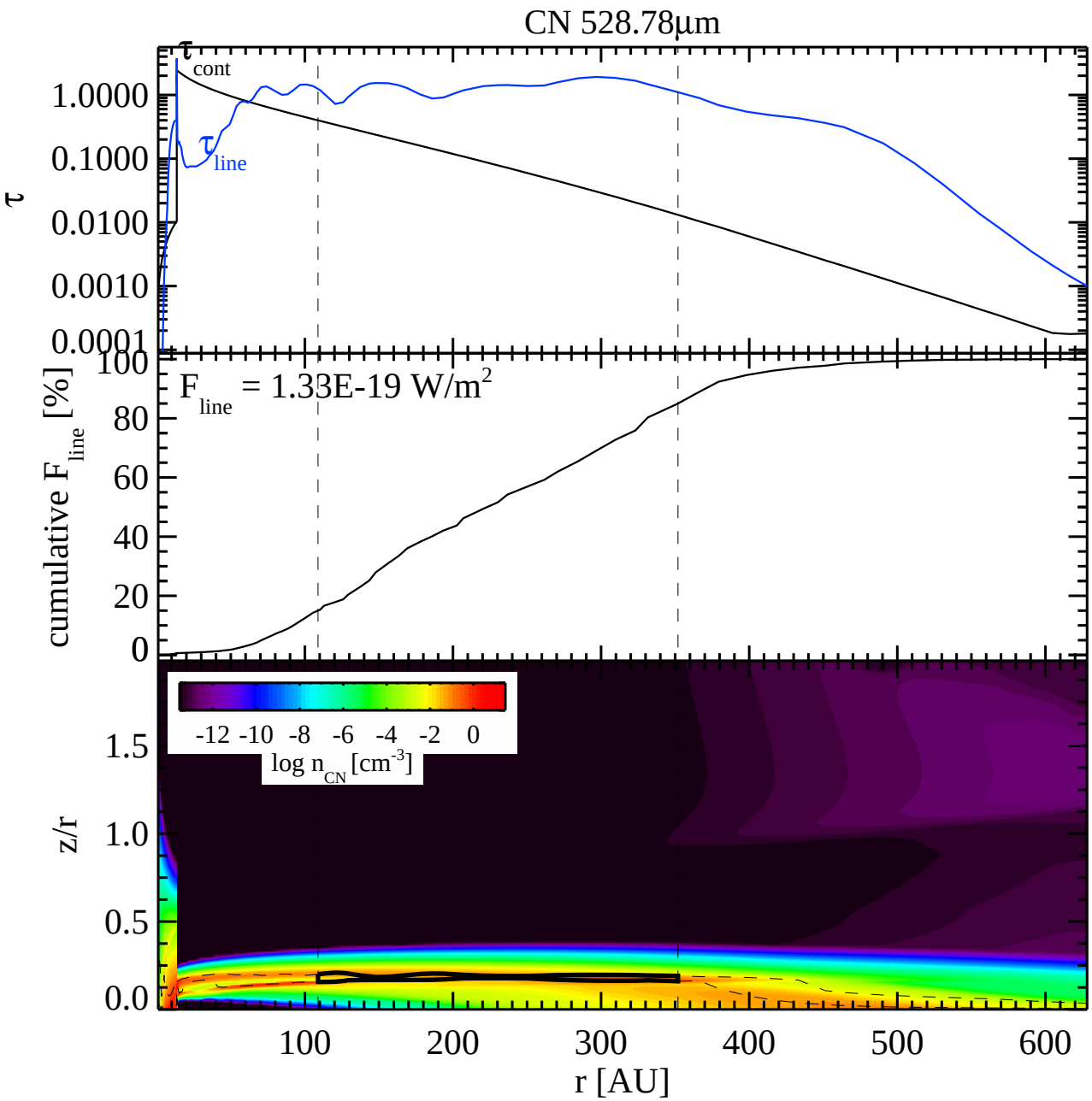

o-H2 2.122µm
τ
100.00
10.00
1.00
0.10
0.01
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 2.16E-19 W/m2
z/r
1.5
1.0
0.5
0.0
-4 -2 0 2 4 6 8 10
log n H2 [cm-3]
1
10
100
r [AU]

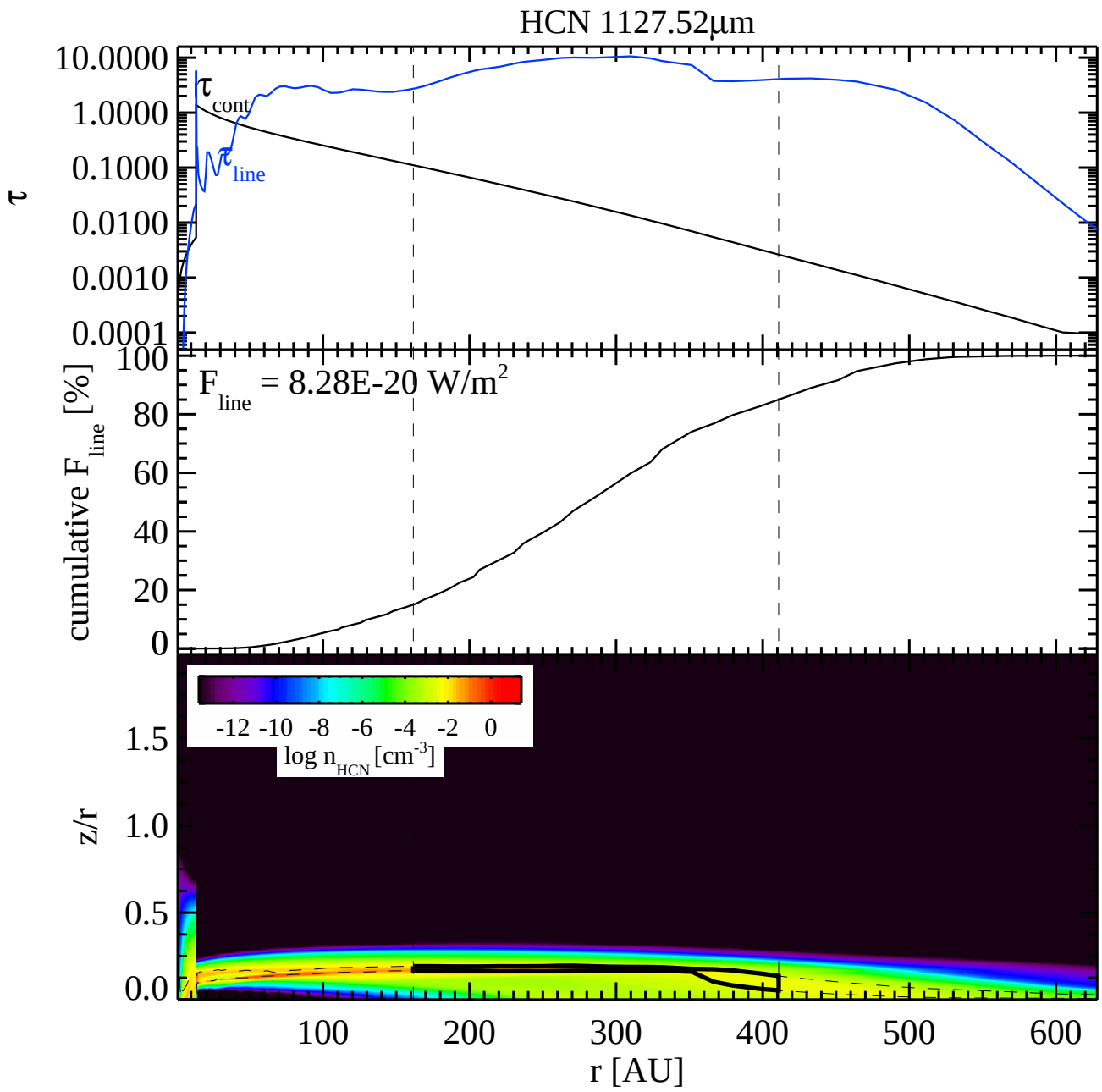

CH+ 179.59µm
τ
cont
τ
line
1.000
0.100
0.010
0.001
τ
F
line
= 2.37E-20 W/m
2
cumulative F
line
[%]
100
80
60
40
20
0
-14 -12 -10 -8 -6 -4 -2
log n
CH+
[cm
-3
]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

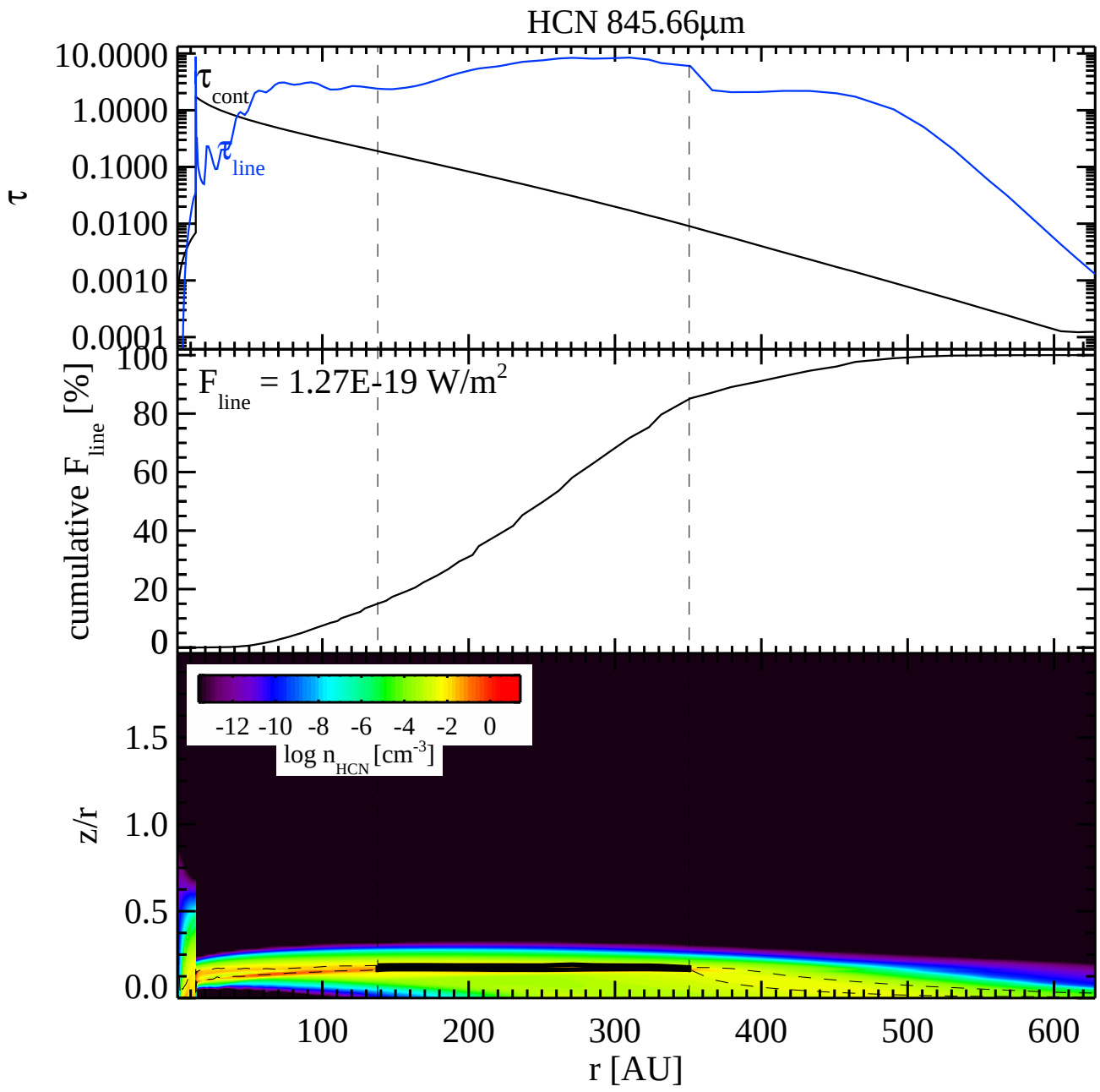

CH+ 90.01µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 3.64E-20 W/m2
-14 -12 -10 -8 -6 -4 -2
log n CH+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

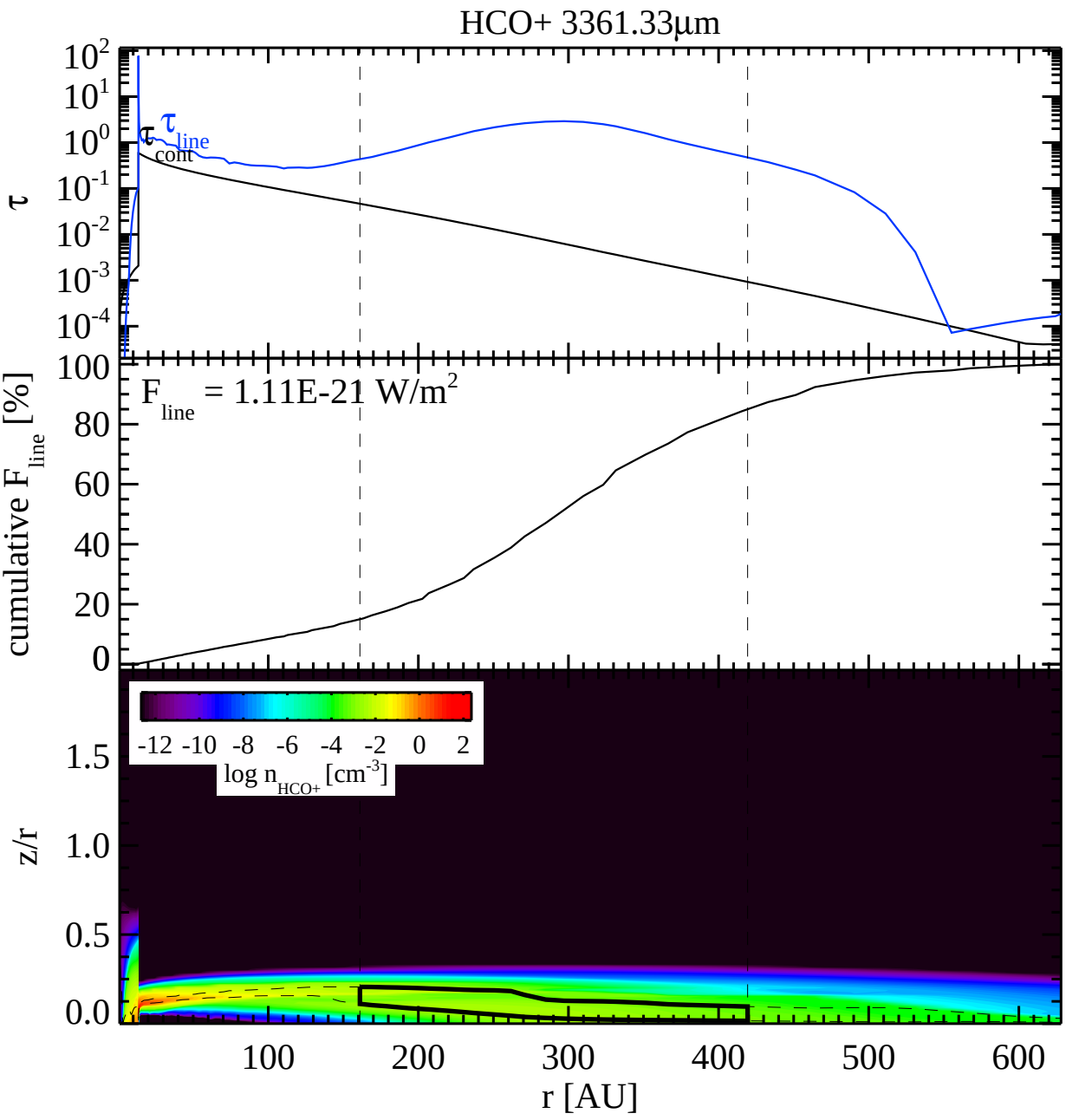

CH+ 72.14µm
τ
10.000
1.000
0.100
0.010
0.001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.71E-20 W/m2
-14 -12 -10 -8 -6 -4 -2
log n CH+ [cm-3]
z/r
1.5
1.0
0.5
0.0
1
10
100
r [AU]

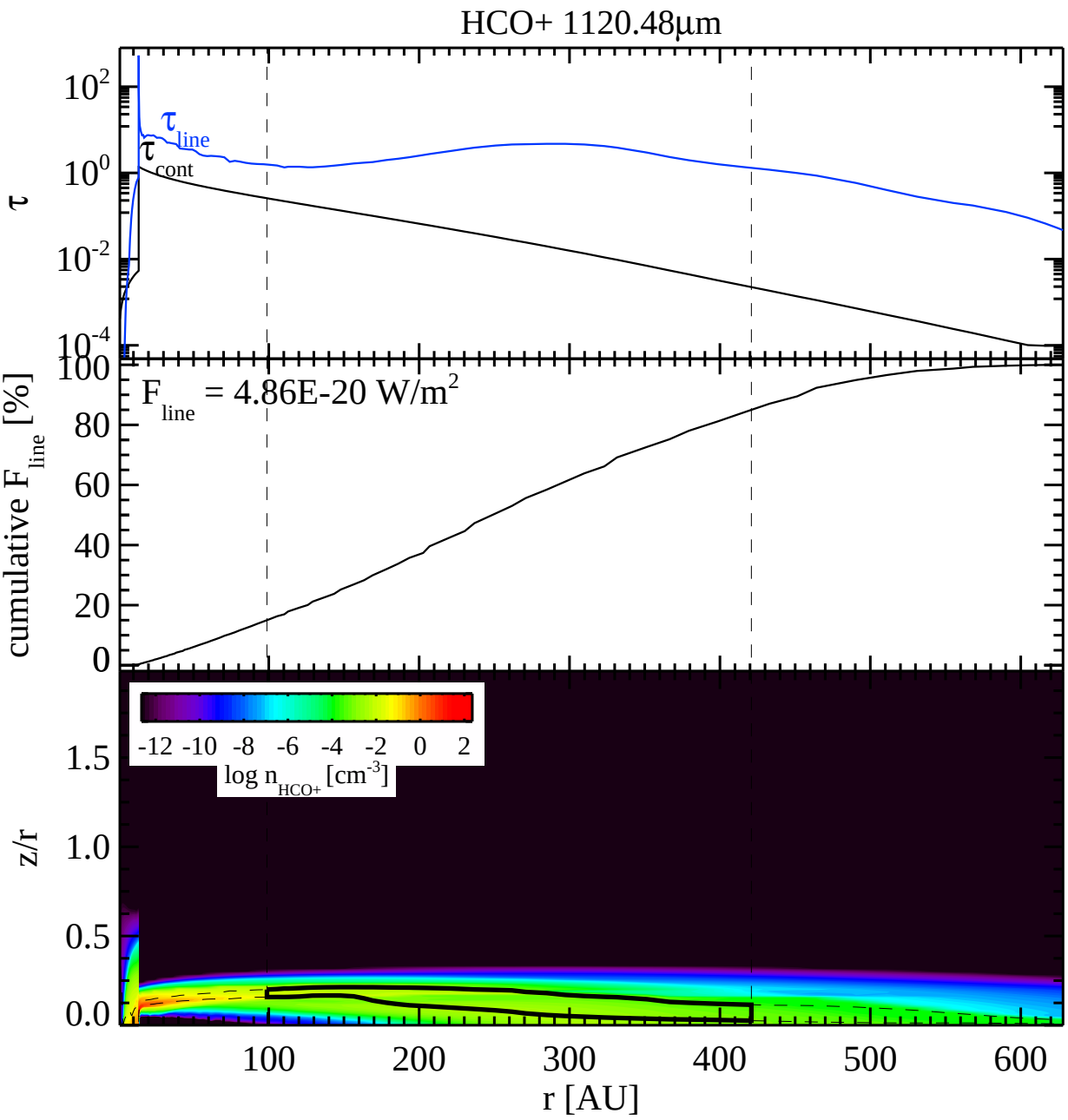

CN 1321.39µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 7.21E-20 W/m2
-12 -10 -8 -6 -4 -2 0
log n CN [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

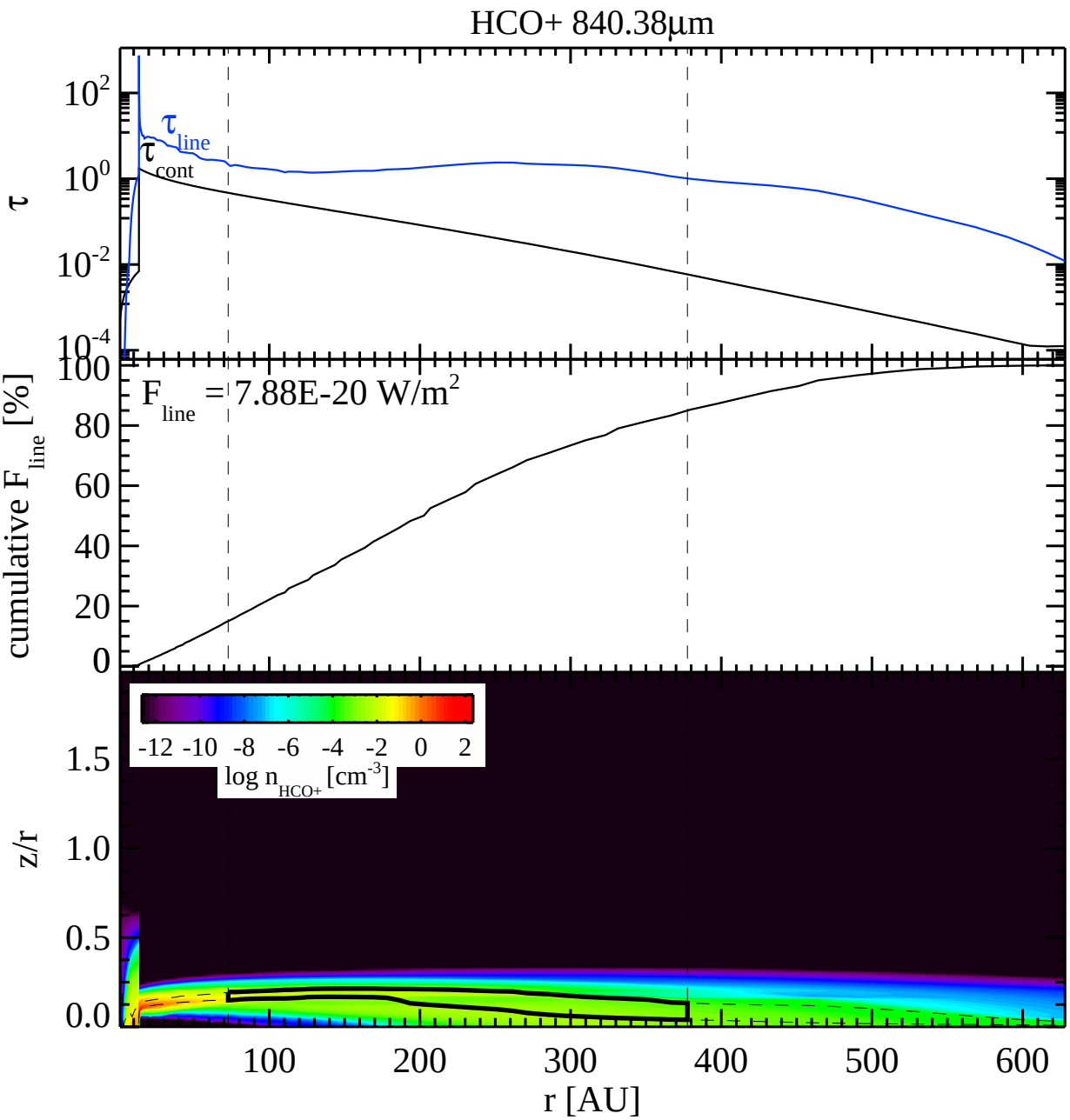

CN 528.78µm
τ
τ cont
τ line
1.0000
0.1000
0.0100
0.0010
0.0001
F line = 1.33E-19 W/m2
cumulative F line [%]
100
80
60
40
20
0
-12 -10 -8 -6 -4 -2 0
log n CN [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

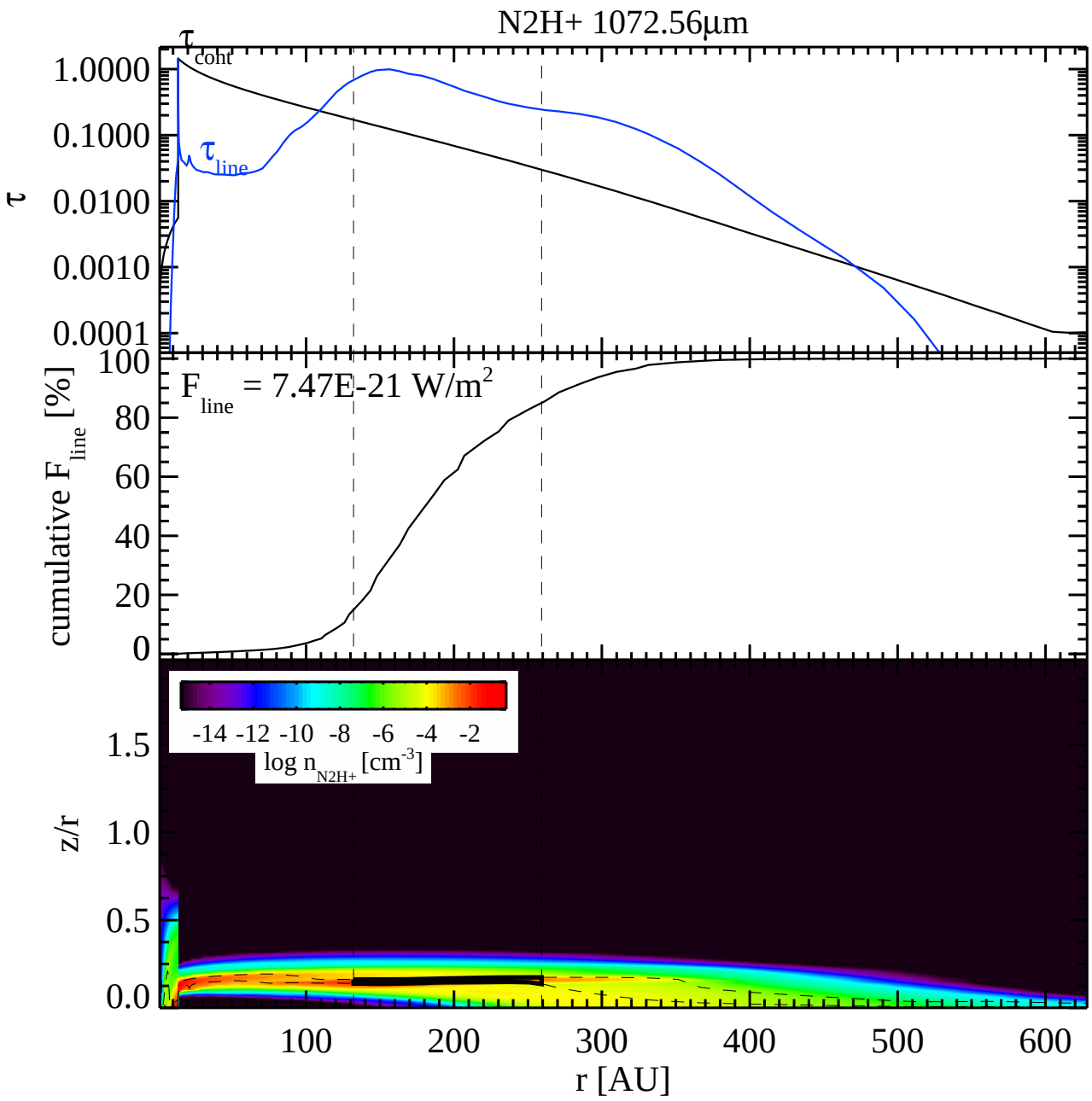

HCN 1127.52µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 8.28E-20 W/m2
-12 -10 -8 -6 -4 -2 0
log n HCN [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

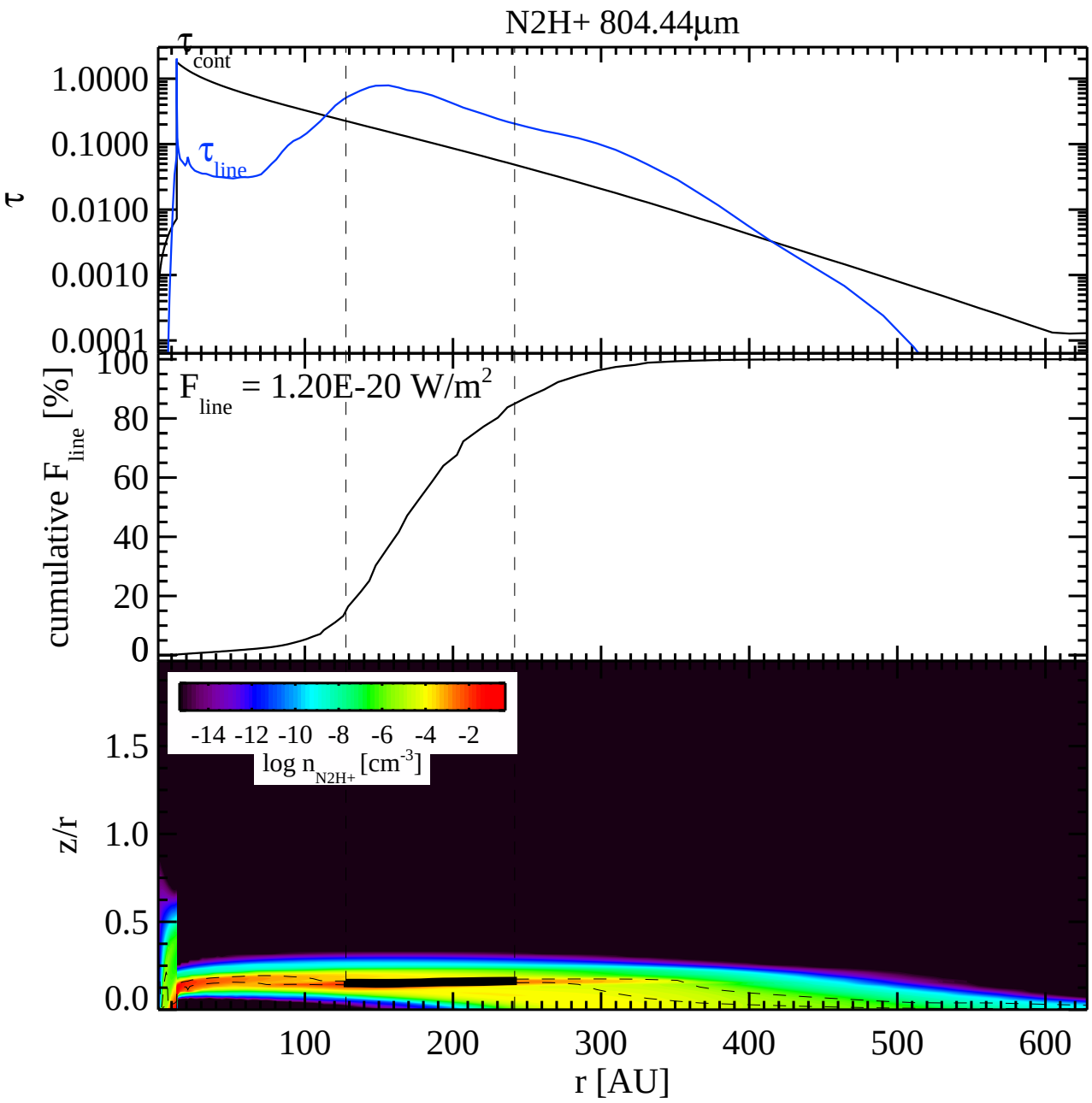

HCN 845.66µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 1.27E-19 W/m2
-12 -10 -8 -6 -4 -2 0
log n HCN [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

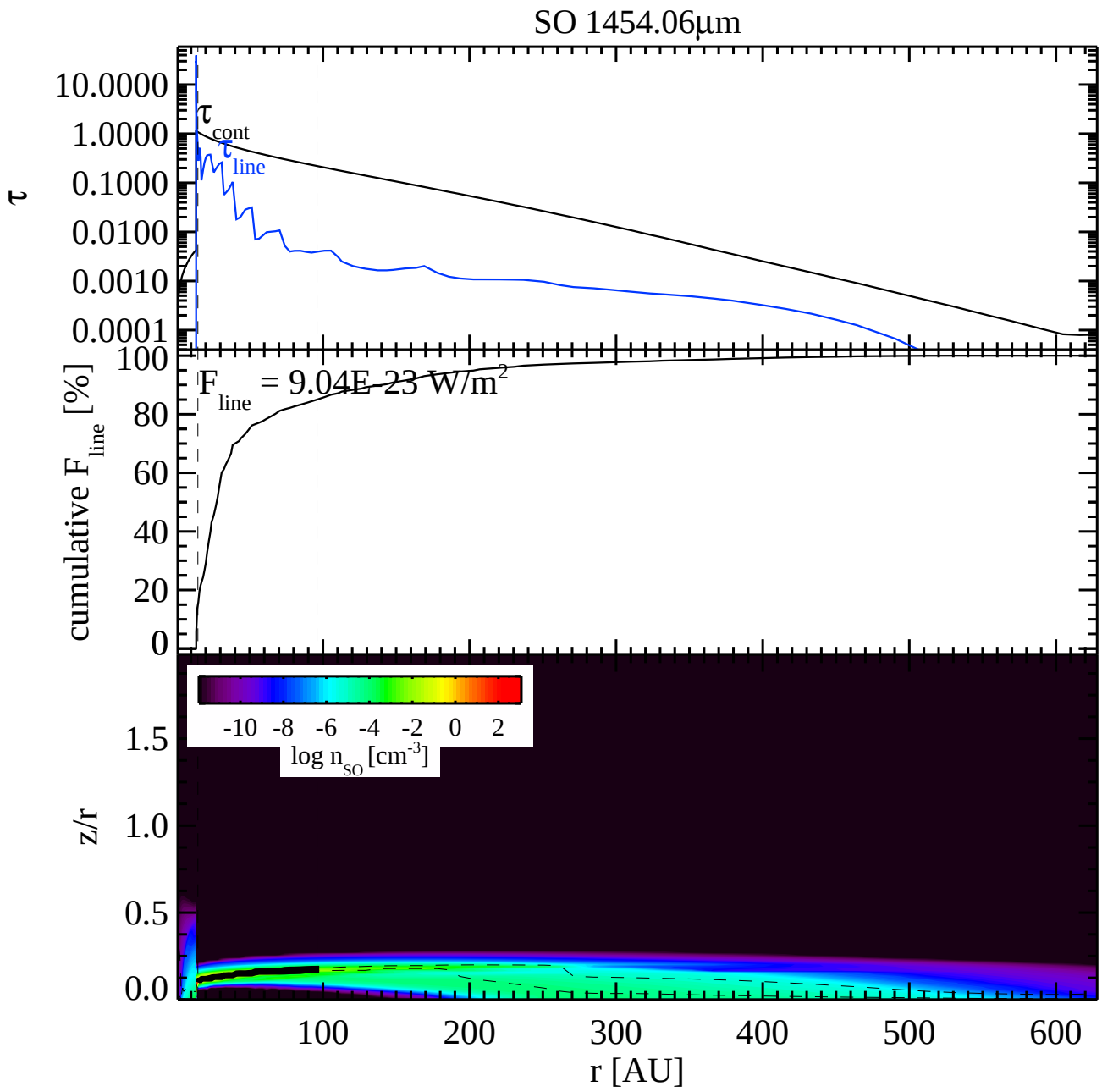

HCO+ 3361.33µm
τ
τ line
τ cont
cumulative F line [%]
F line = 1.11E-21 W/m2
-12 -10 -8 -6 -4 -2 0 2
log n HCO+ [cm-3]
z/r
r [AU]

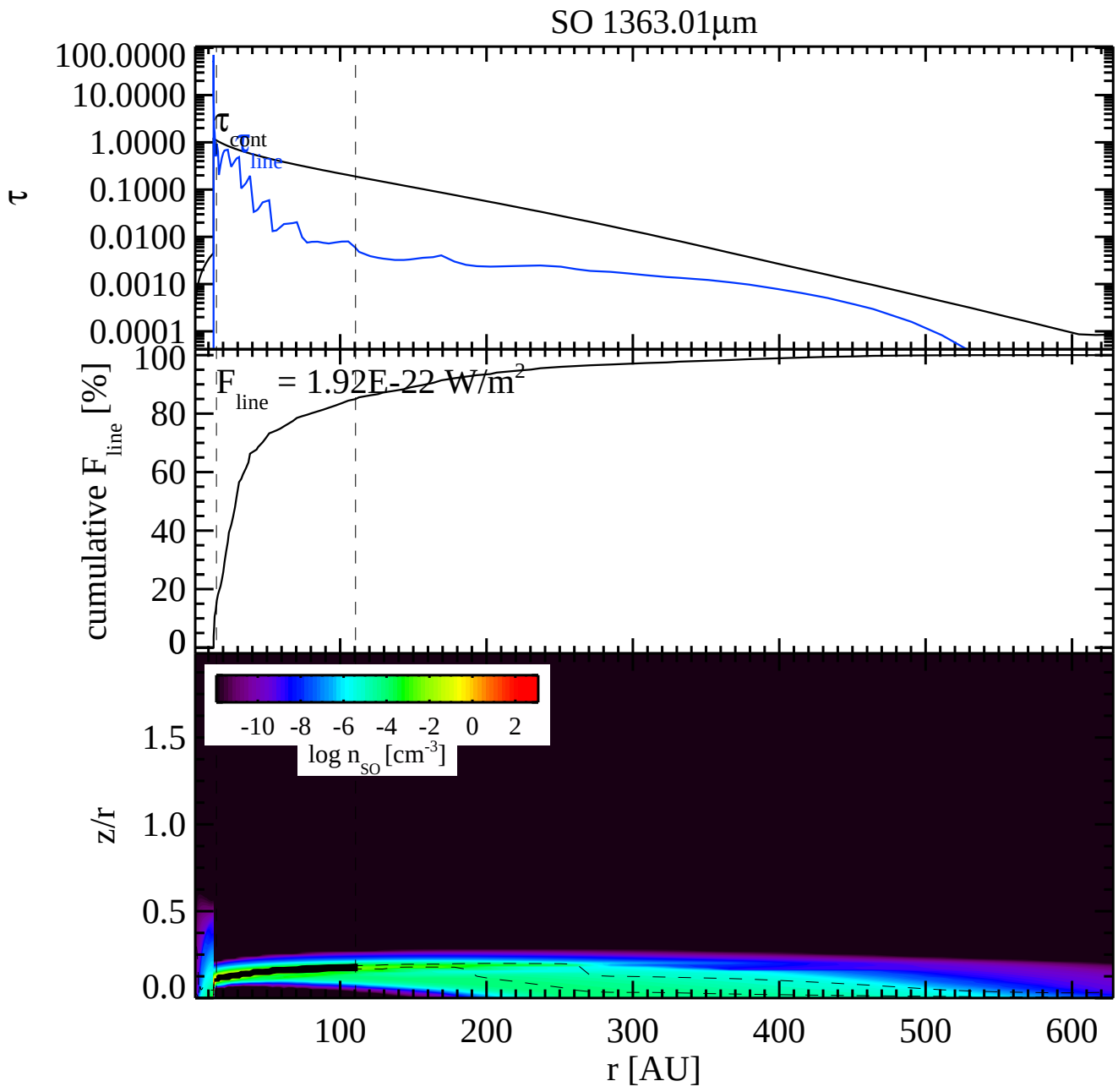

HCO+ 1120.48µm
τ
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 4.86E-20 W/m^2
-12 -10 -8 -6 -4 -2 0 2
log n_{HCO+} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

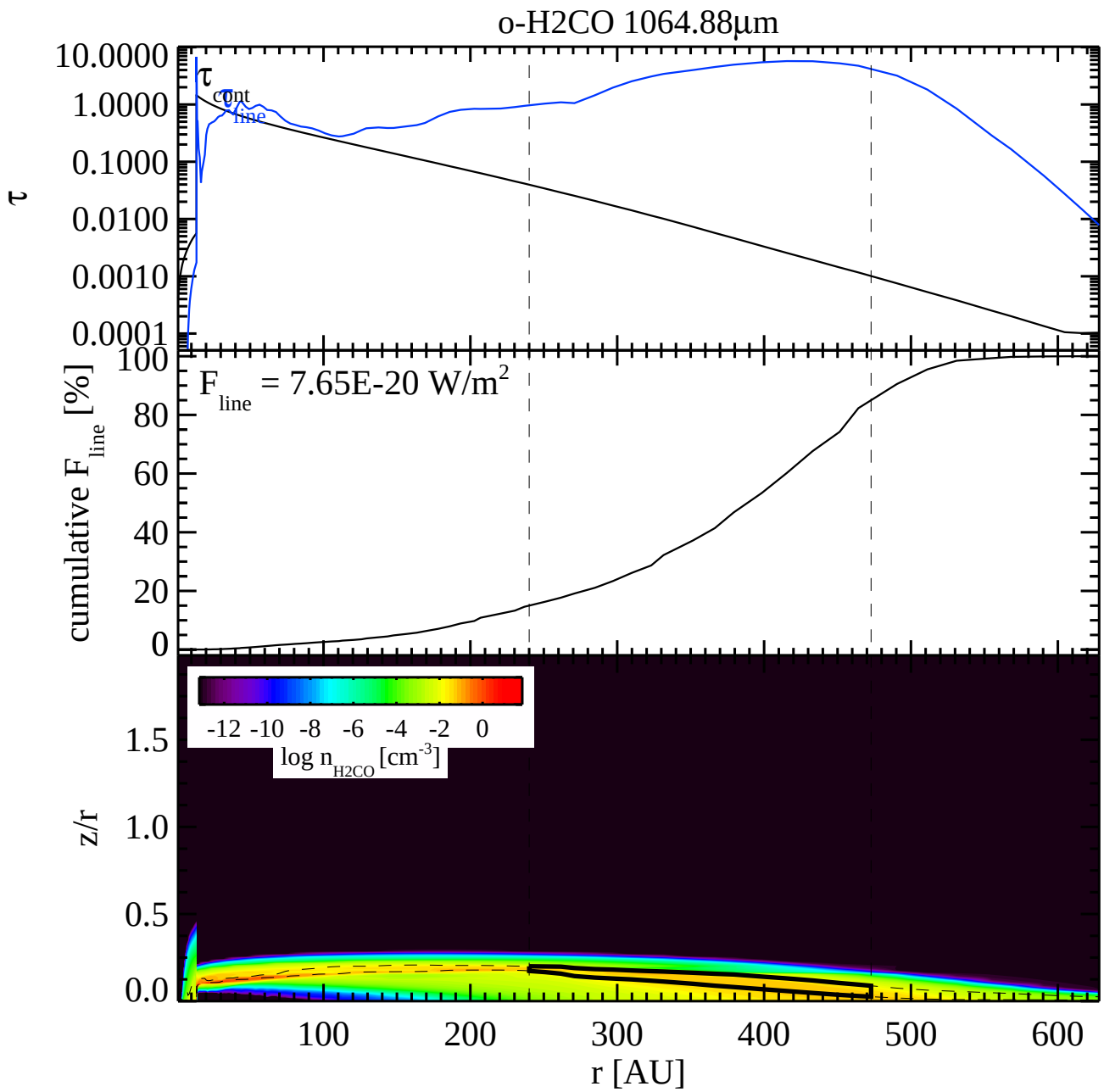

HCO+ 840.38µm
τ
10^2
10^0
10^{-2}
10^{-4}
τ_{line}
τ_{cont}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 7.88E-20 W/m^2
-12 -10 -8 -6 -4 -2 0 2
log n_{HCO+} [cm^{-3}]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

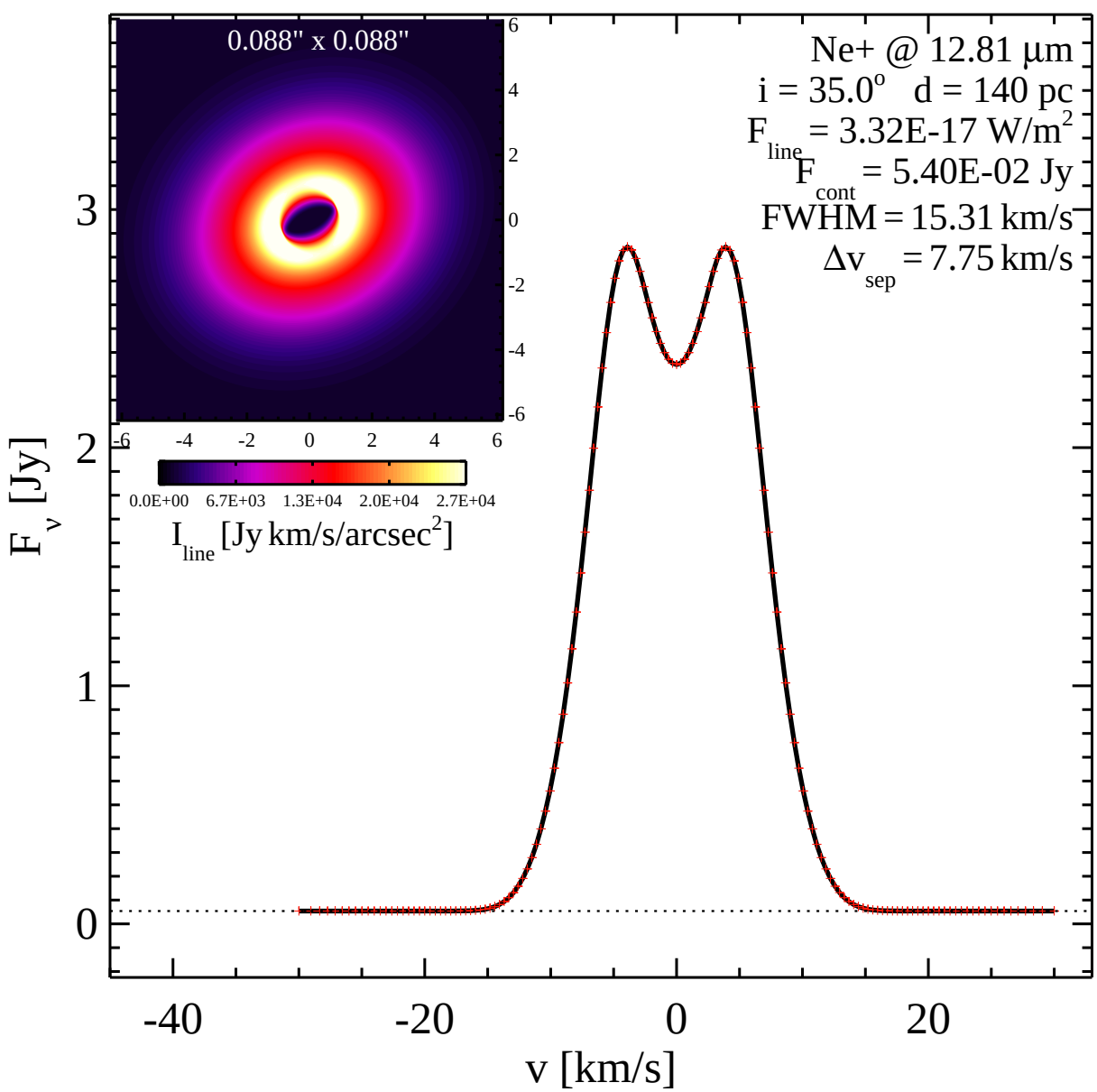

N2H+ 1072.56µm
τ
τ cont
τ line
1.0000
0.1000
0.0100
0.0010
0.0001
cumulative F line [%]
100
80
60
40
20
0
F line = 7.47E-21 W/m2
-14 -12 -10 -8 -6 -4 -2
log n N2H+ [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

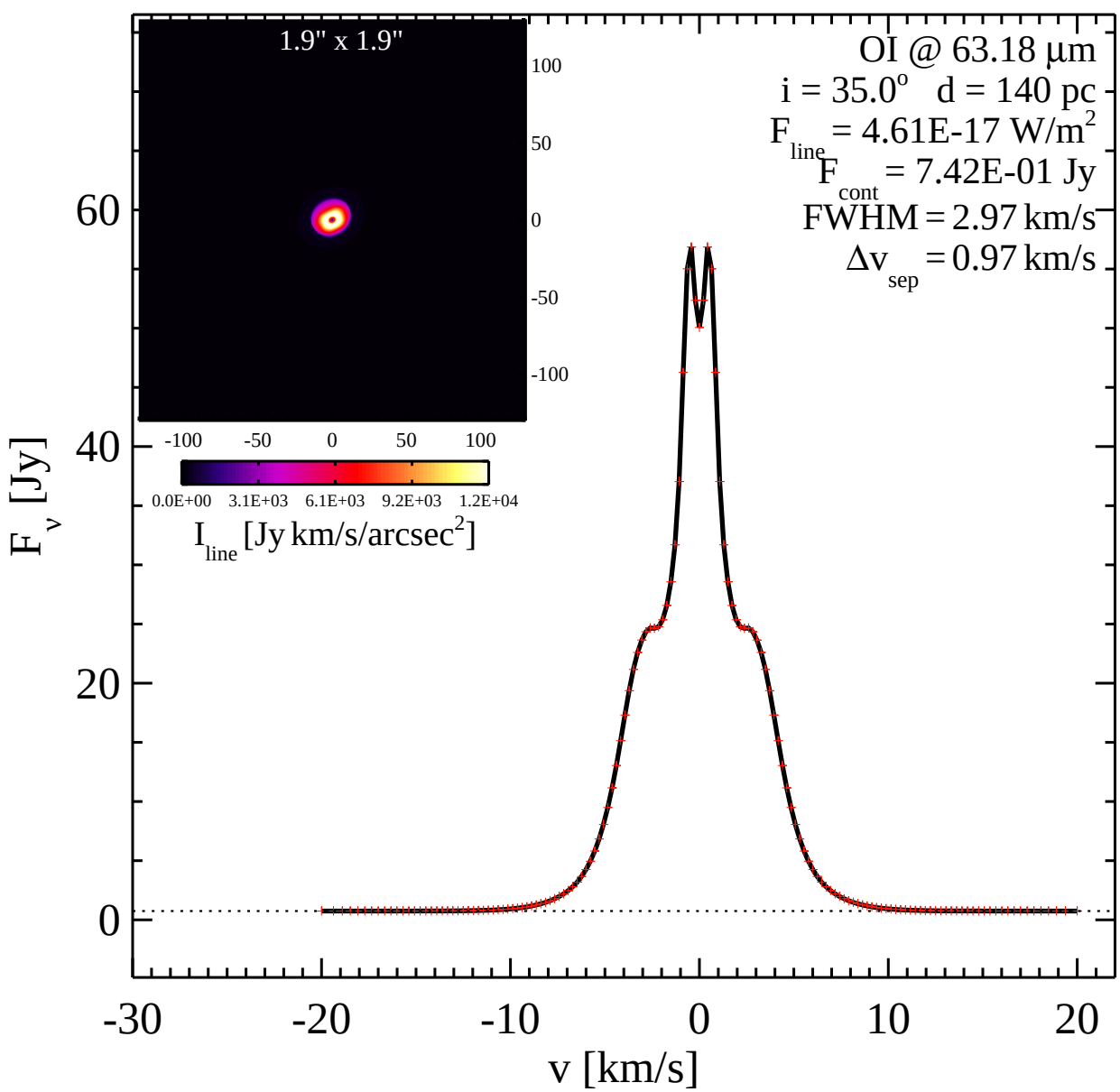

N2H+ 804.44µm
τ
cont
τ
line
1.0000
0.1000
0.0100
0.0010
0.0001
τ
F
line
= 1.20E-20 W/m
2
100
80
60
40
20
0
cumulative F
line
[%]
-14 -12 -10 -8 -6 -4 -2
log n
N2H+
[cm
-3
]
1.5
1.0
0.5
0.0
z/r
100
200
300
400
500
600
r [AU]

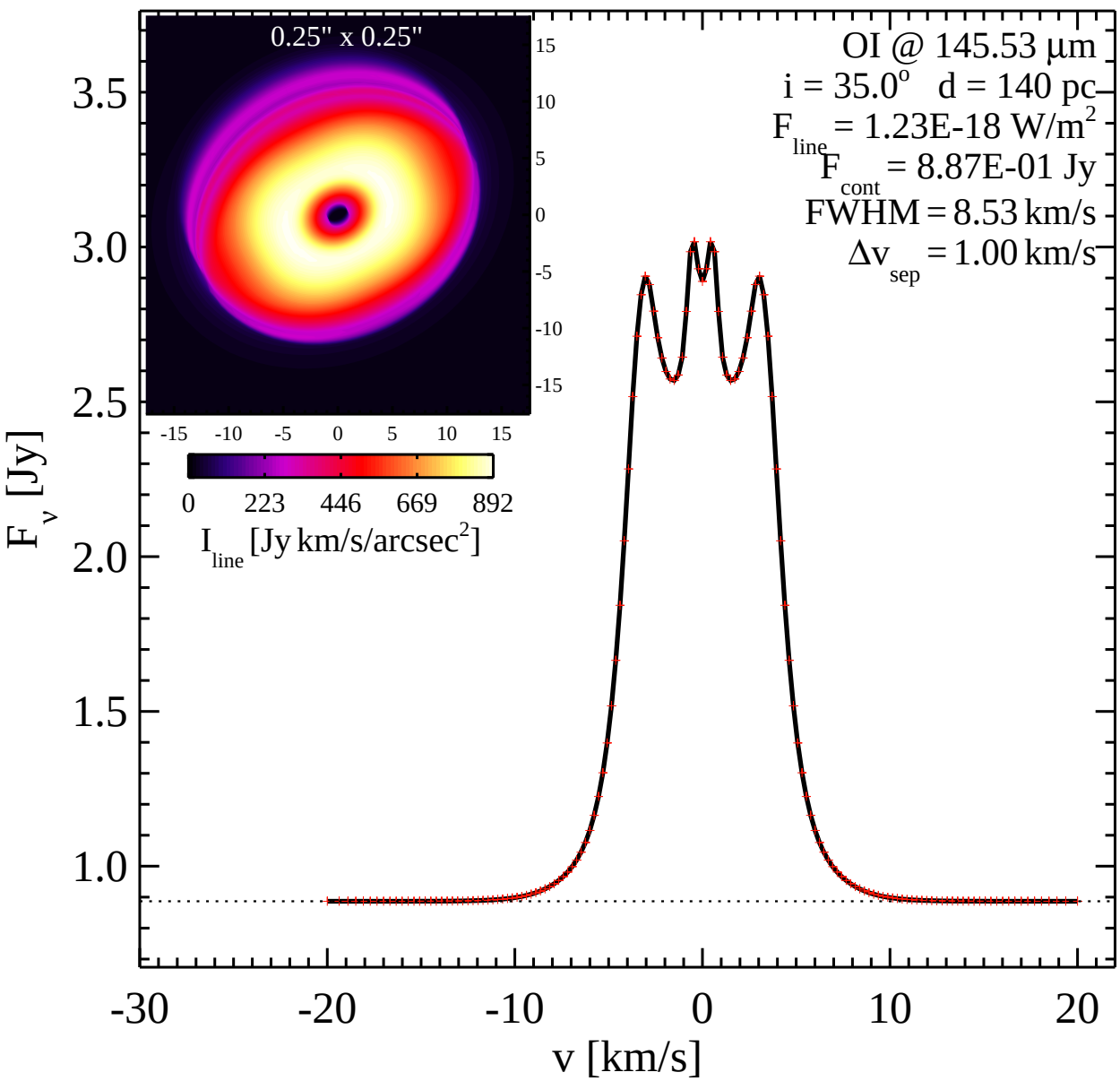

SO 1454.06µm
τ
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ cont
τ line
cumulative F line [%]
100
80
60
40
20
0
F line = 9.04E-23 W/m2
-10 -8 -6 -4 -2 0 2
log n SO [cm-3]
z/r
1.5
1.0
0.5
0.0
100 200 300 400 500 600
r [AU]

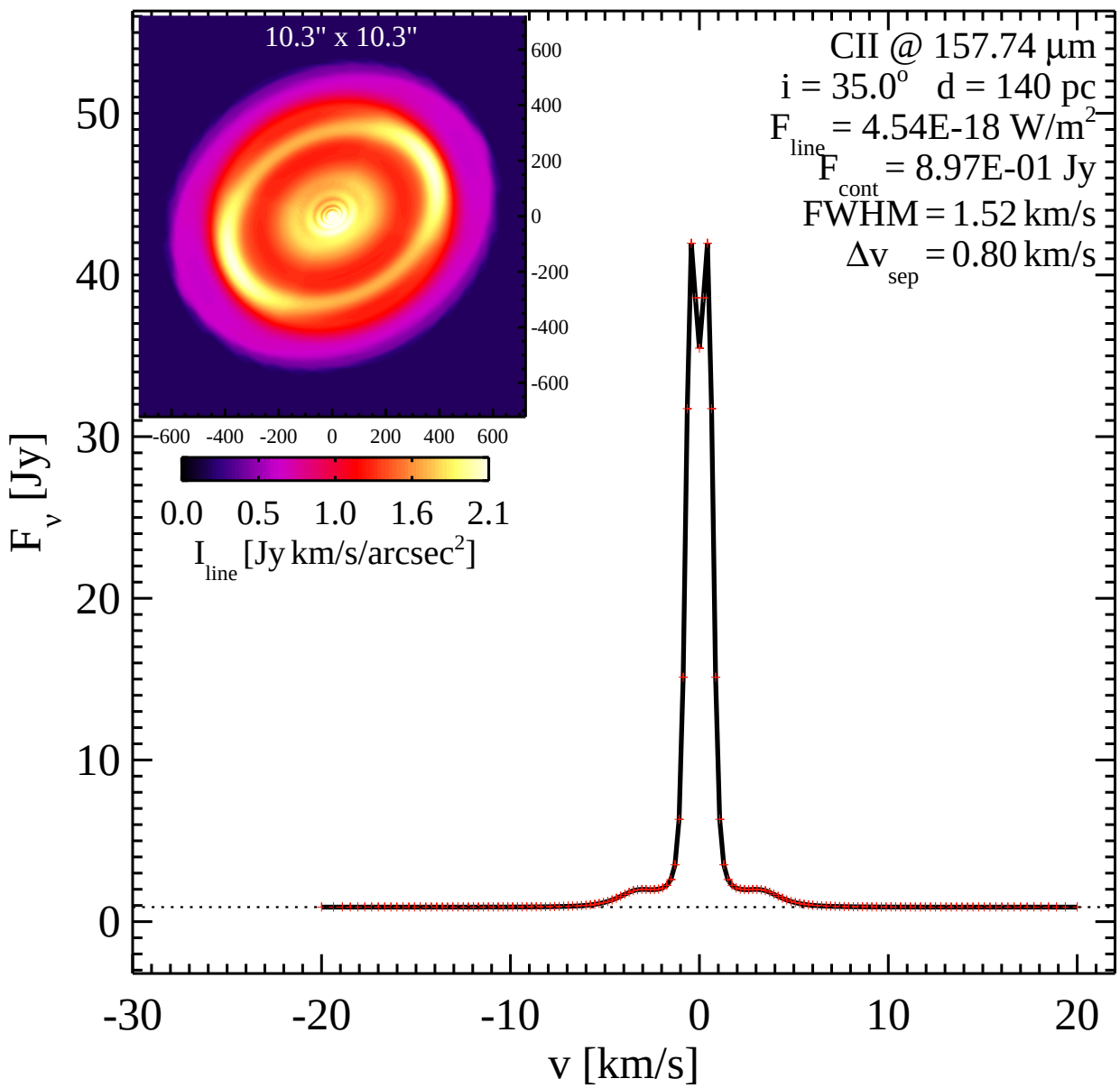

SO 1363.01µm
100.0000
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
τ
τ cont
τ line
100
80
60
40
20
0
cumulative F line [%]
F line = 1.92E-22 W/m2
-10 -8 -6 -4 -2 0 2
log n SO [cm-3]
1.5
1.0
0.5
0.0
z/r
100
200
300
400
500
600
r [AU]

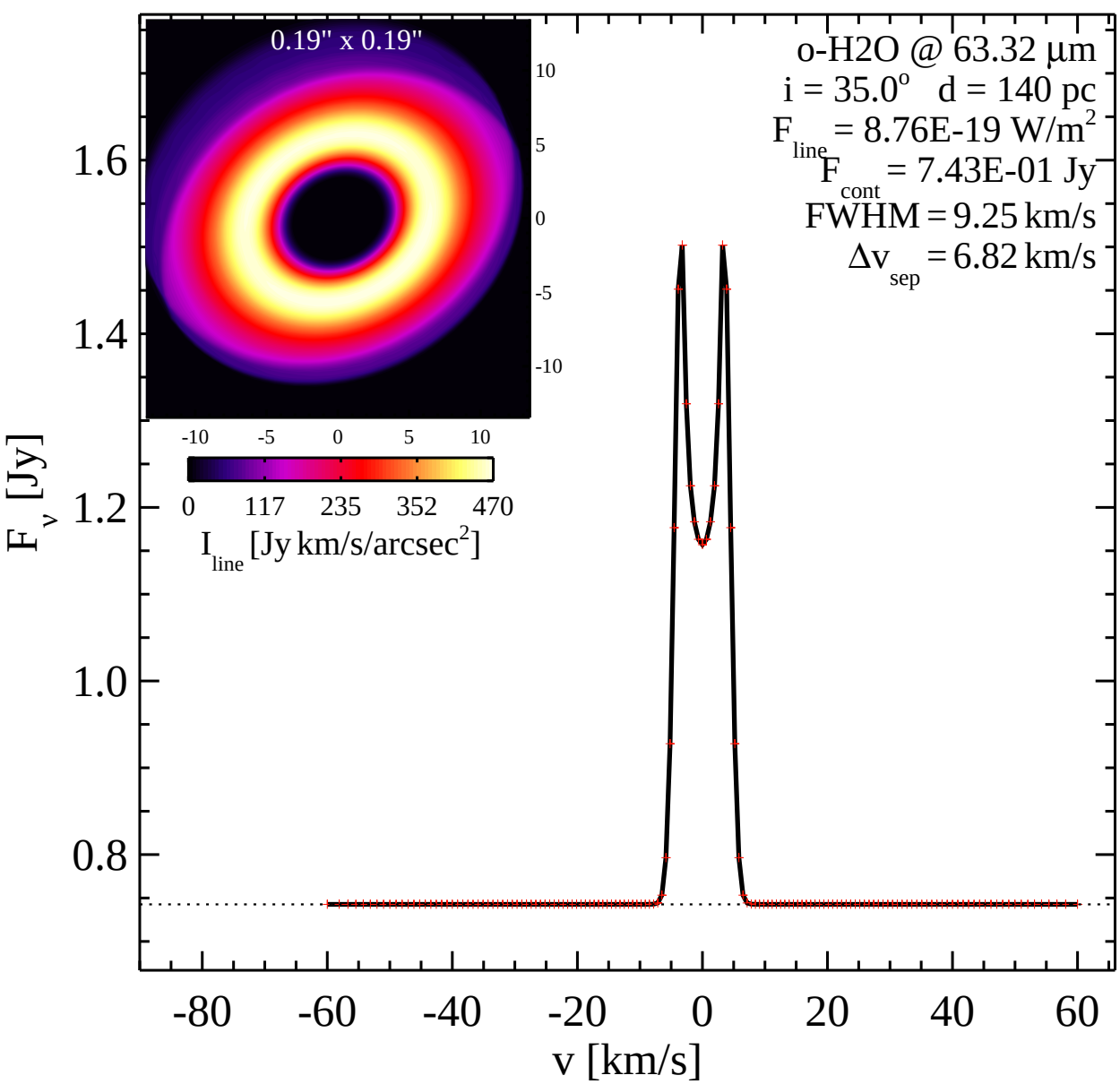

o-H2CO 1064.88µm
τ
τ cont
τ line
10.0000
1.0000
0.1000
0.0100
0.0010
0.0001
cumulative F line [%]
F line = 7.65E-20 W/m2
100
80
60
40
20
0
-12 -10 -8 -6 -4 -2 0
log n H2CO [cm-3]
z/r
1.5
1.0
0.5
0.0
100
200
300
400
500
600
r [AU]

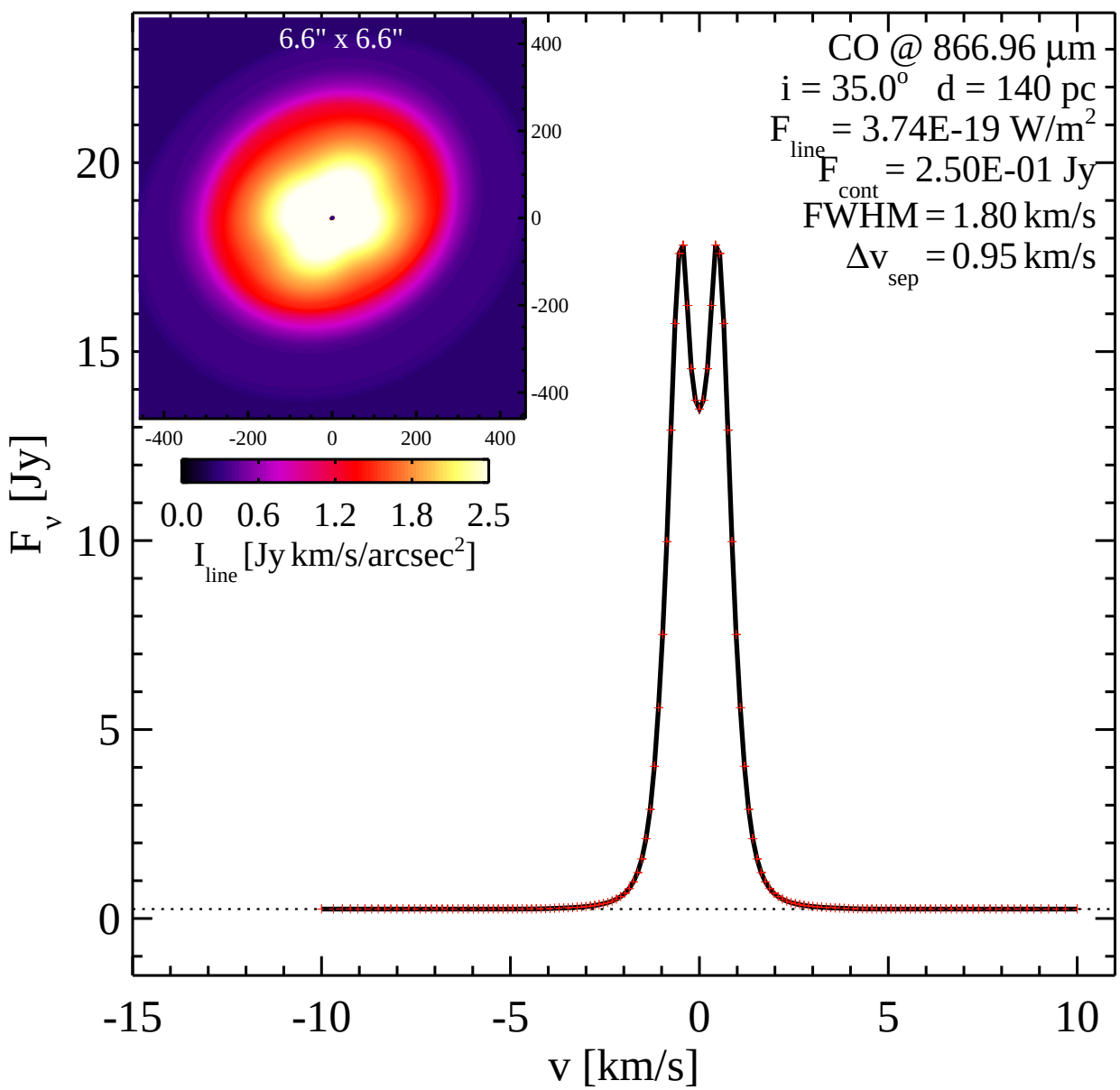

0.088" x 0.088"
Ne+ @ 12.81 μm
i = 35.0° d = 140 pc
F line = 3.32E-17 W/m2
F cont = 5.40E-02 Jy
FWHM = 15.31 km/s
Δv sep = 7.75 km/s
0.0E+00 6.7E+03 1.3E+04 2.0E+04 2.7E+04
I line [Jy km/s/arcsec2]
F v [Jy]
v [km/s]

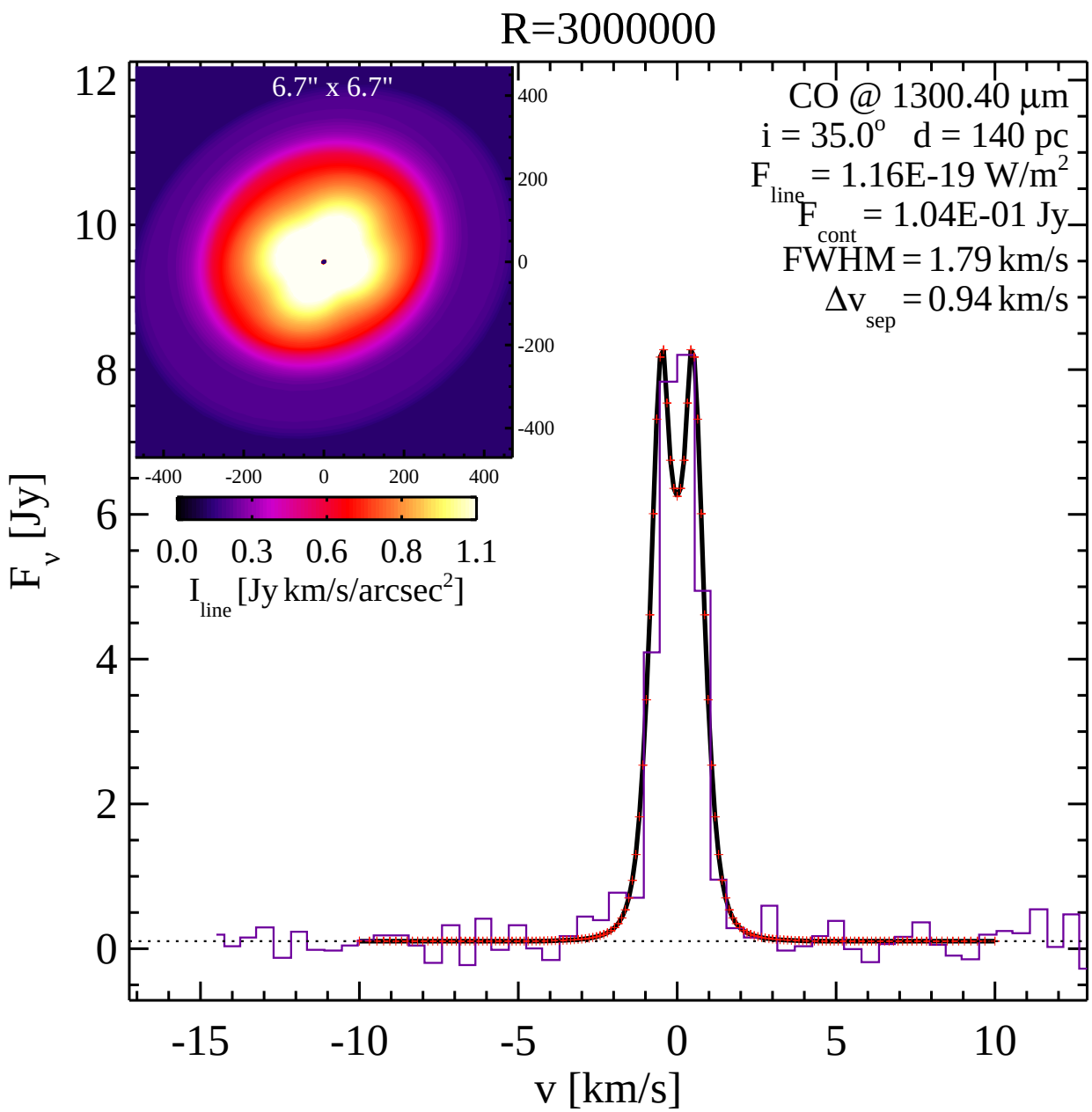

1.9" x 1.9"
100
50
0
-50
-100
-100 -50 0 50 100
0.0E+00 3.1E+03 6.1E+03 9.2E+03 1.2E+04
I line [Jy km/s/arcsec2]
OI @ 63.18 µm
i = 35.0o d = 140 pc
F line = 4.61E-17 W/m2
F cont = 7.42E-01 Jy
FWHM = 2.97 km/s
Δv sep = 0.97 km/s
F v [Jy]
0
20
40
60
-30 -20 -10 0 10 20
v [km/s]

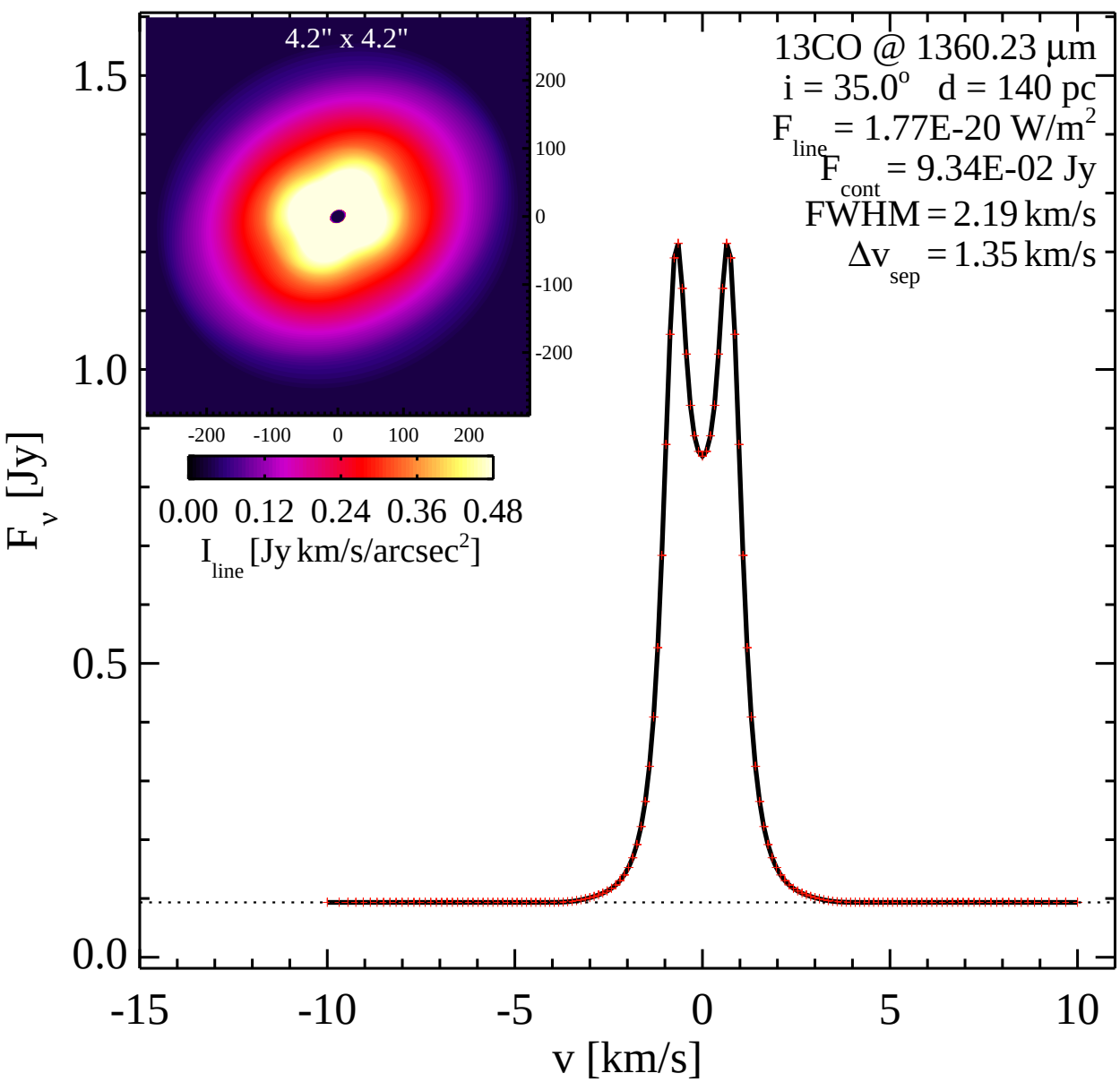

0.25" x 0.25"
OI @ 145.53 µm
i = 35.0° d = 140 pc
F line = 1.23E-18 W/m2
F cont = 8.87E-01 Jy
FWHM = 8.53 km/s
Δv sep = 1.00 km/s
F v [Jy]
v [km/s]
I line [Jy km/s/arcsec2]
0 223 446 669 892

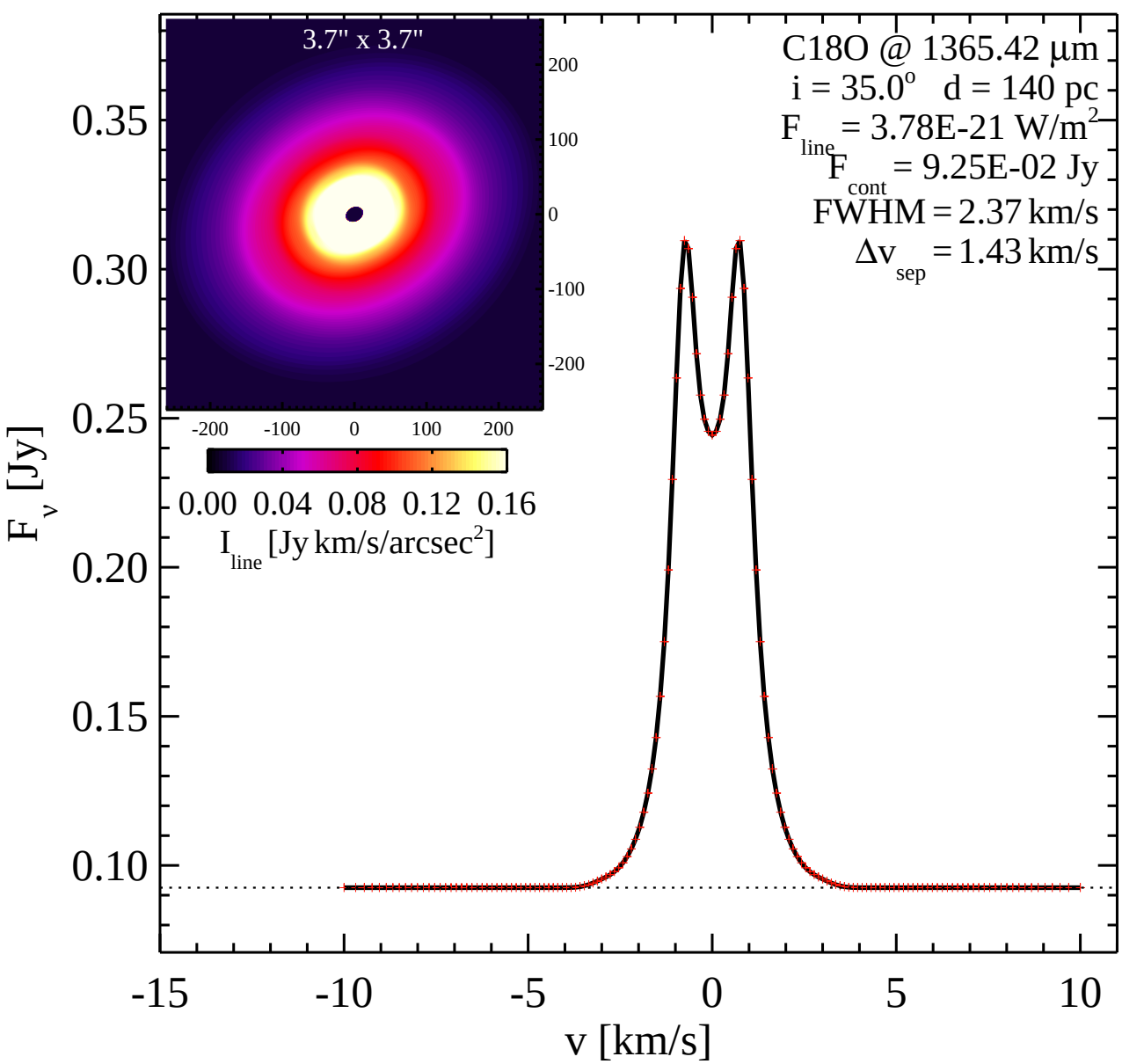

10.3" x 10.3"
600
400
200
0
-200
-400
-600
-600 -400 -200 0 200 400 600
0.0 0.5 1.0 1.6 2.1
I line [Jy km/s/arcsec2]
CII @ 157.74 µm
i = 35.0o d = 140 pc
F line = 4.54E-18 W/m2
F cont = 8.97E-01 Jy
FWHM = 1.52 km/s
Δv sep = 0.80 km/s
F v [Jy]
50
40
30
20
10
0
-30 -20 -10 0 10 20
v [km/s]

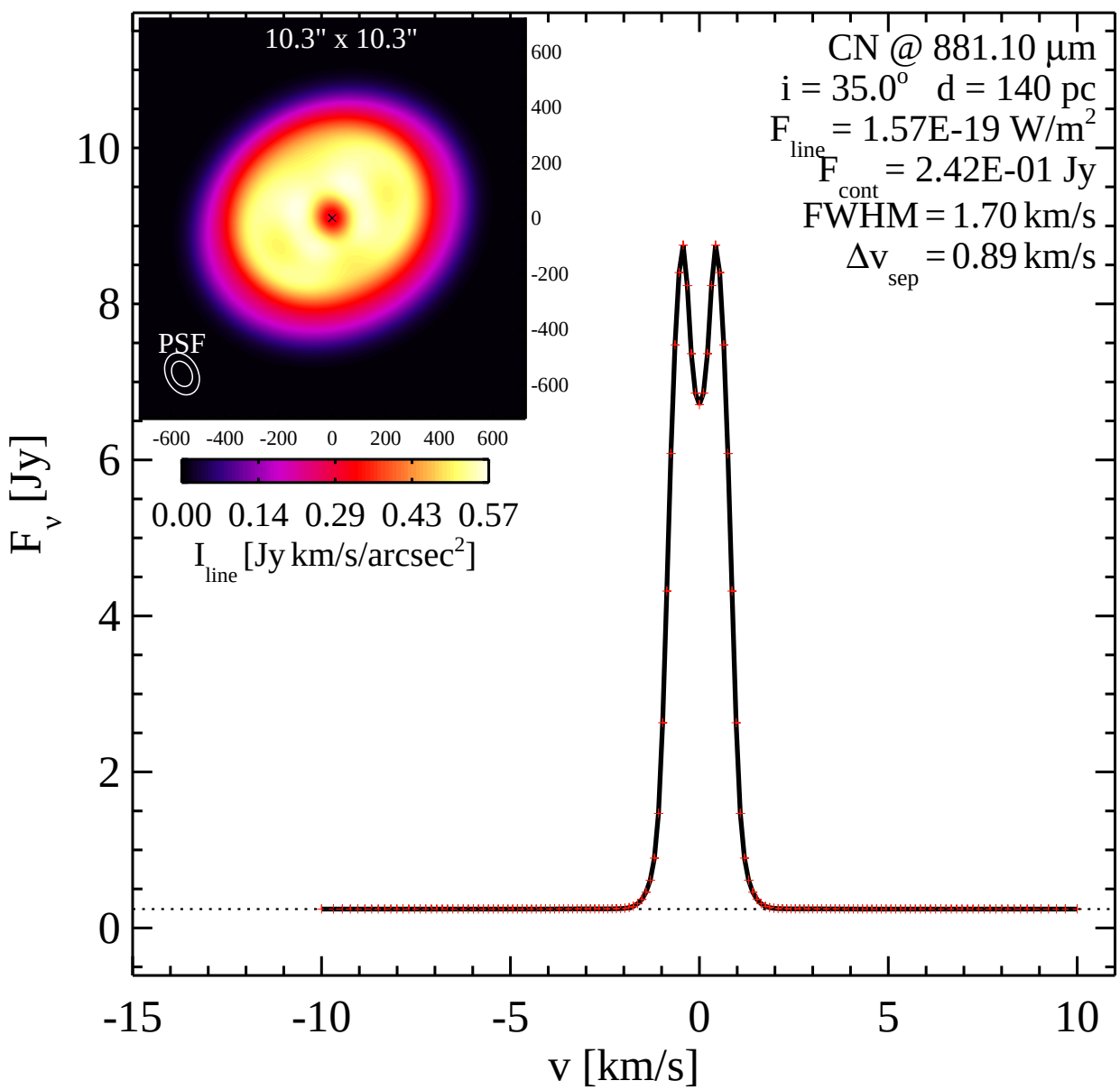

0.19" x 0.19"
10
5
0
-5
-10
-10 -5 0 5 10
0 117 235 352 470
I line [Jy km/s/arcsec2]
o-H2O @ 63.32 µm
i = 35.0o d = 140 pc
F line = 8.76E-19 W/m2
F cont = 7.43E-01 Jy
FWHM = 9.25 km/s
Δv sep = 6.82 km/s
F v [Jy]
1.6
1.4
1.2
1.0
0.8
-80 -60 -40 -20 0 20 40 60
v [km/s]

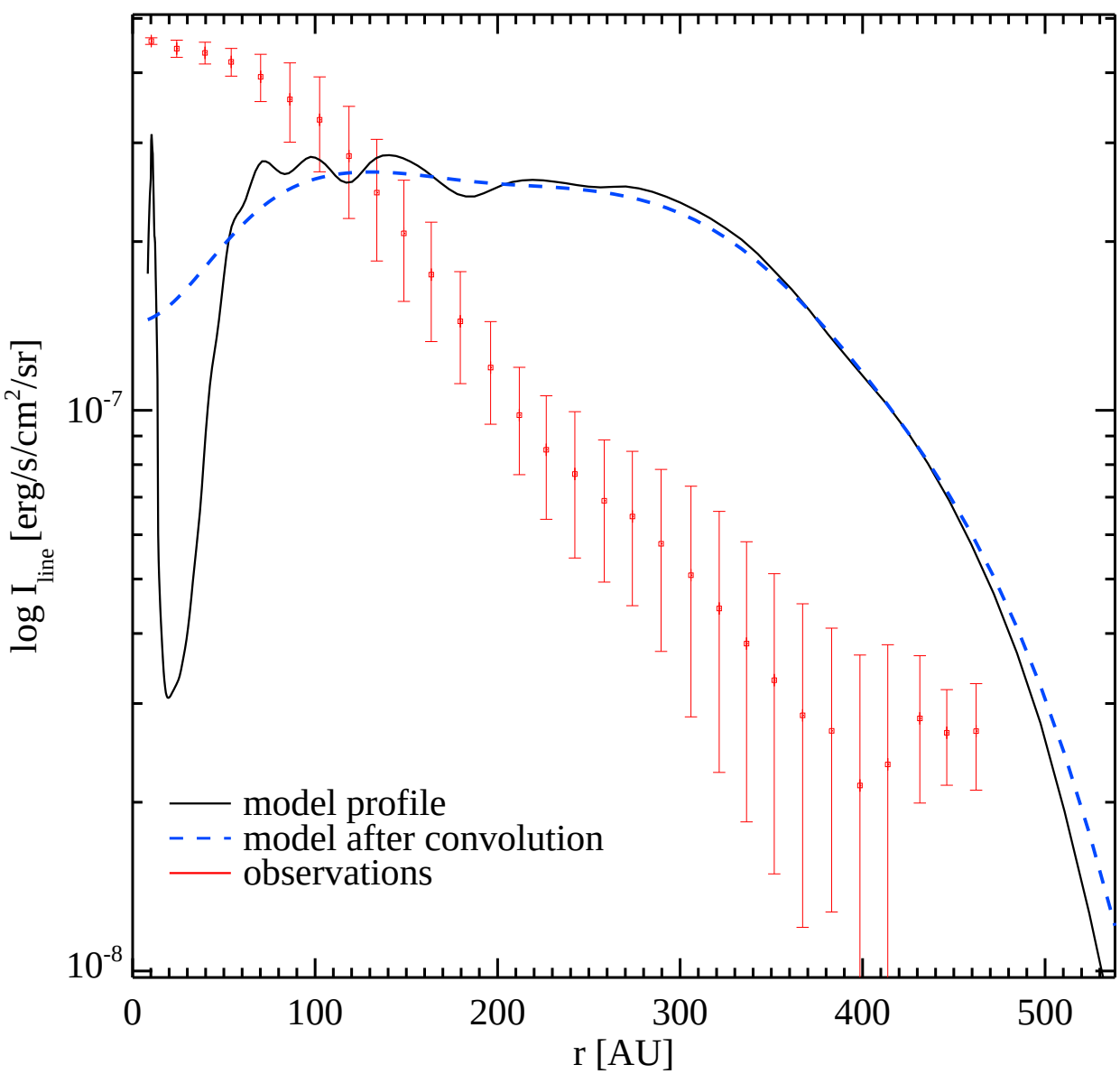

6.6" x 6.6"
CO @ 866.96 µm
i = 35.0° d = 140 pc
F line = 3.74E-19 W/m2
F cont = 2.50E-01 Jy
FWHM = 1.80 km/s
Δv sep = 0.95 km/s
F v [Jy]
v [km/s]
I line [Jy km/s/arcsec2]
0.0 0.6 1.2 1.8 2.5
-400 -200 0 200 400
-15 -10 -5 0 5 10
0 5 10 15 20

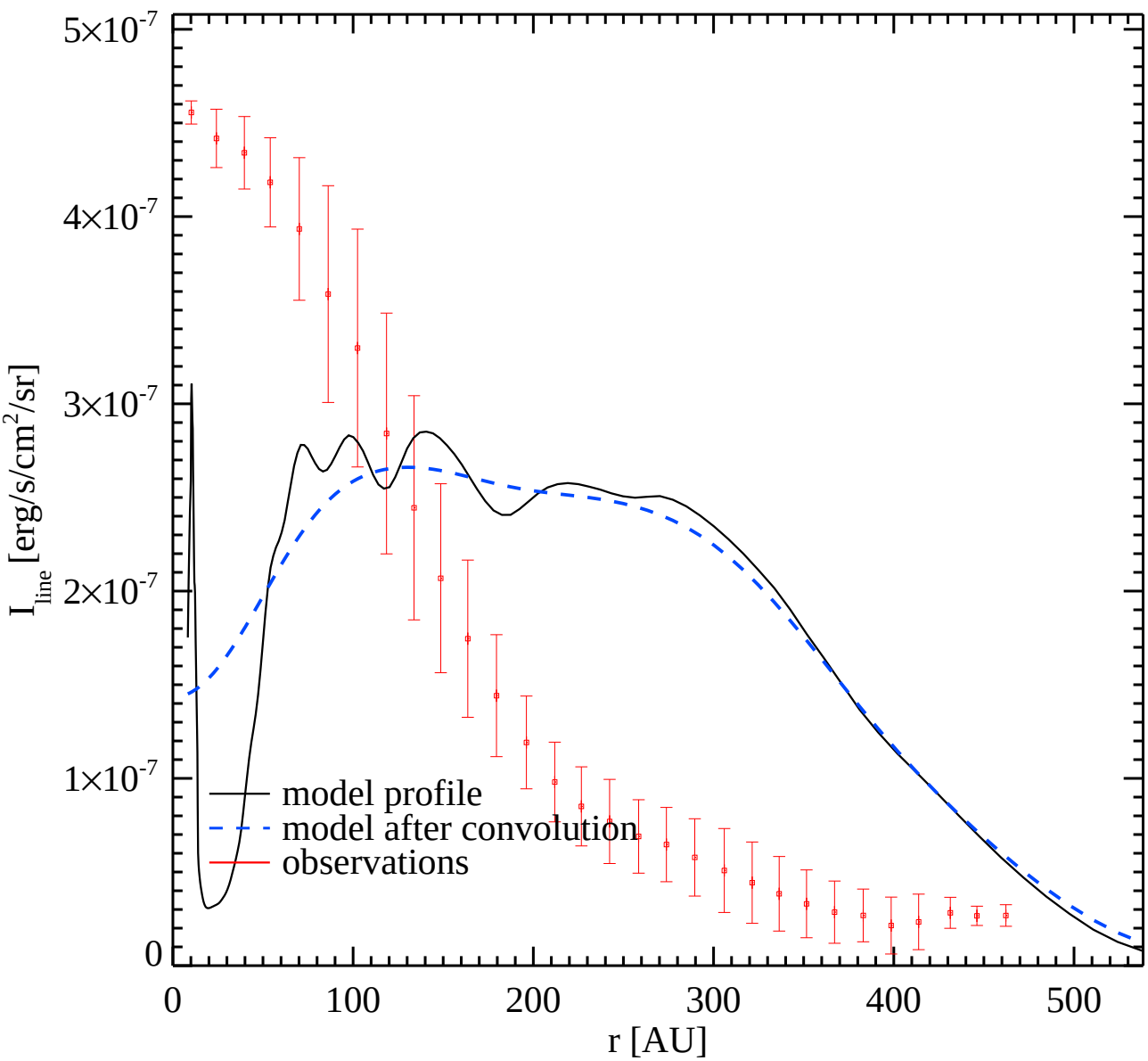

R=3000000
6.7" x 6.7"
CO @ 1300.40 µm
i = 35.0° d = 140 pc
F line = 1.16E-19 W/m2
F cont = 1.04E-01 Jy
FWHM = 1.79 km/s
Δv sep = 0.94 km/s
0.0 0.3 0.6 0.8 1.1
I line [Jy km/s/arcsec2]
F v [Jy]
v [km/s]

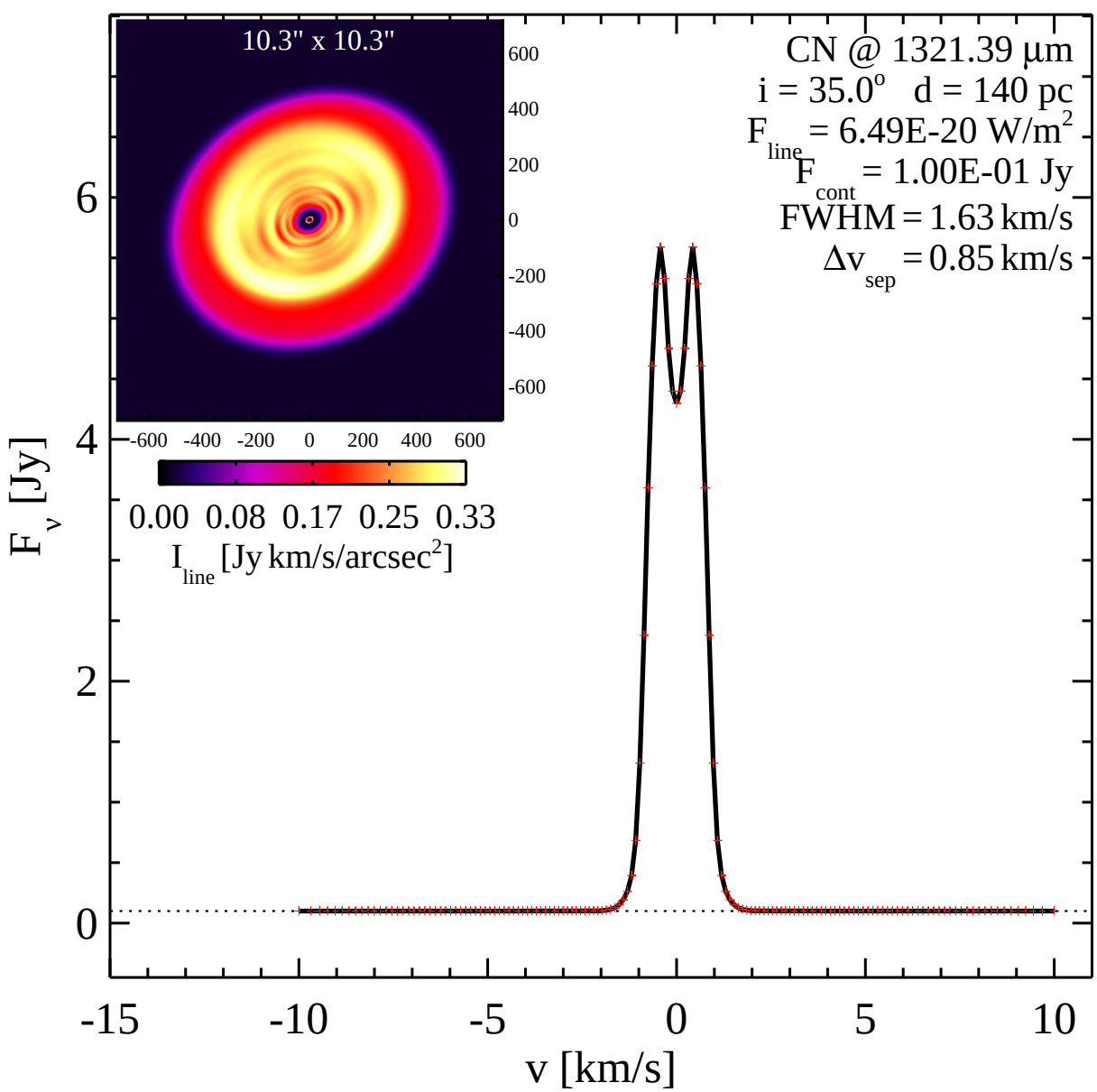

4.2" x 4.2"
200
100
0
-100
-200
-200 -100 0 100 200
0.00 0.12 0.24 0.36 0.48
I line [Jy km/s/arcsec2]
13CO @ 1360.23 µm
i = 35.0o d = 140 pc
F line = 1.77E-20 W/m2
F cont = 9.34E-02 Jy
FWHM = 2.19 km/s
Δv sep = 1.35 km/s
F v [Jy]
1.5
1.0
0.5
0.0
-15 -10 -5 0 5 10
v [km/s]

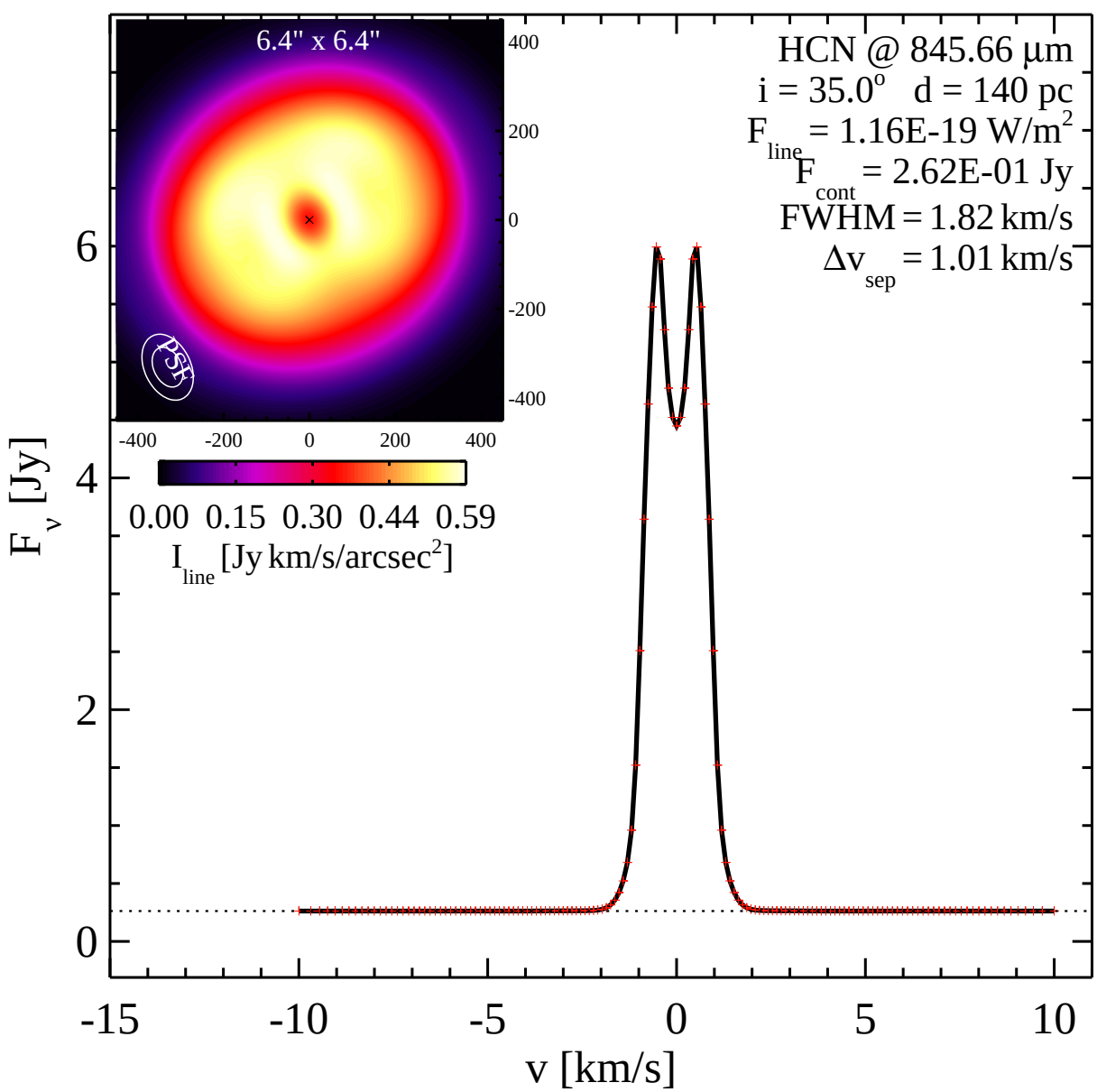

3.7" x 3.7"
200
100
0
-100
-200
-200 -100 0 100 200
0.00 0.04 0.08 0.12 0.16
I line [Jy km/s/arcsec2]
C18O @ 1365.42 µm
i = 35.0o d = 140 pc
F line = 3.78E-21 W/m2
F cont = 9.25E-02 Jy
FWHM = 2.37 km/s
Δv sep = 1.43 km/s
F v [Jy]
0.35
0.30
0.25
0.20
0.15
0.10
-15 -10 -5 0 5 10
v [km/s]

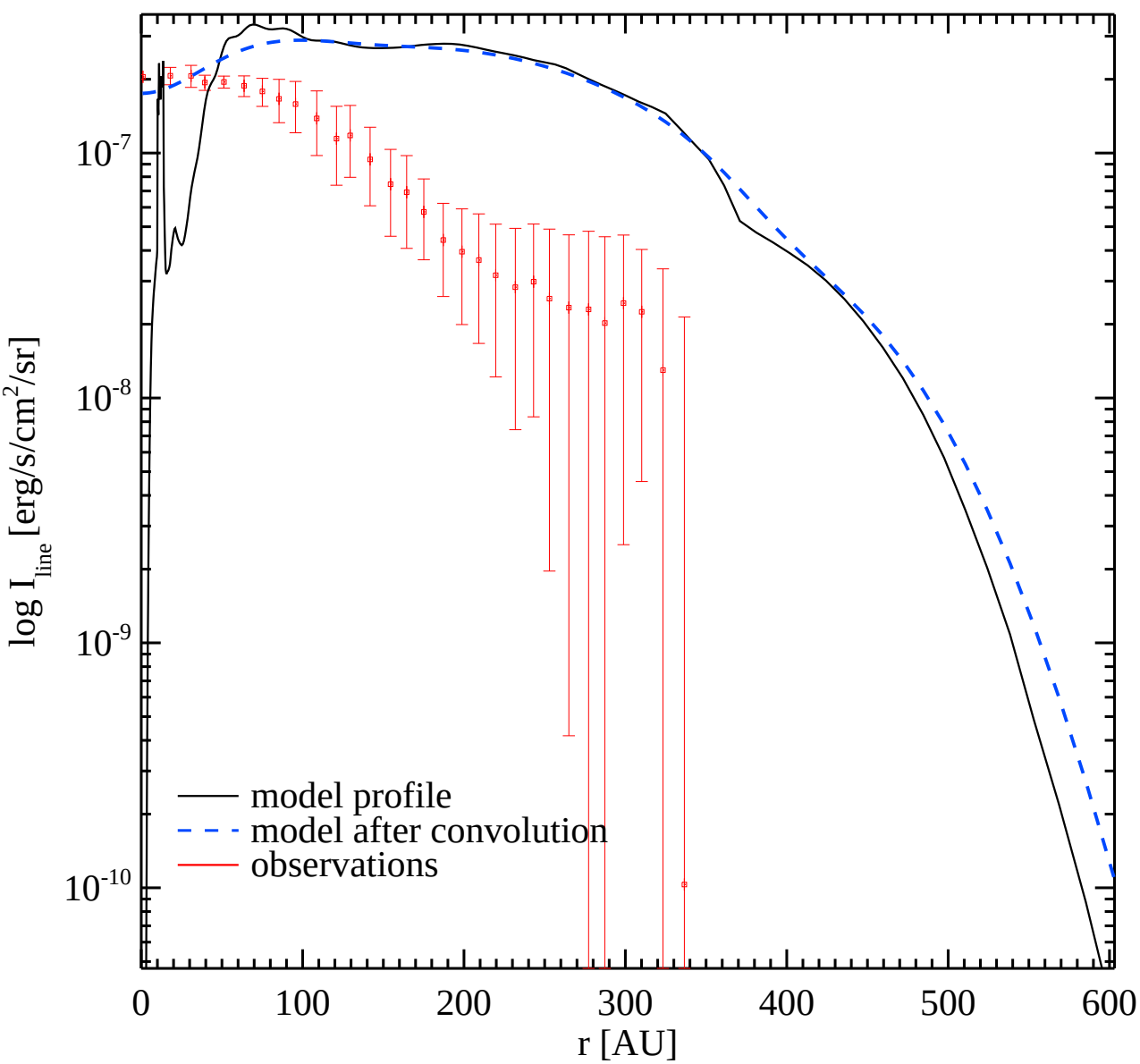

10.3" x 10.3"
PSF
600
400
200
0
-200
-400
-600
-600 -400 -200 0 200 400 600
0.00 0.14 0.29 0.43 0.57
I line [Jy km/s/arcsec2]
CN @ 881.10 µm
i = 35.0o d = 140 pc
F line = 1.57E-19 W/m2
F cont = 2.42E-01 Jy
FWHM = 1.70 km/s
Δv sep = 0.89 km/s
F v [Jy]
v [km/s]
0
2
4
6
8
10
-15
-10
-5
0
5
10

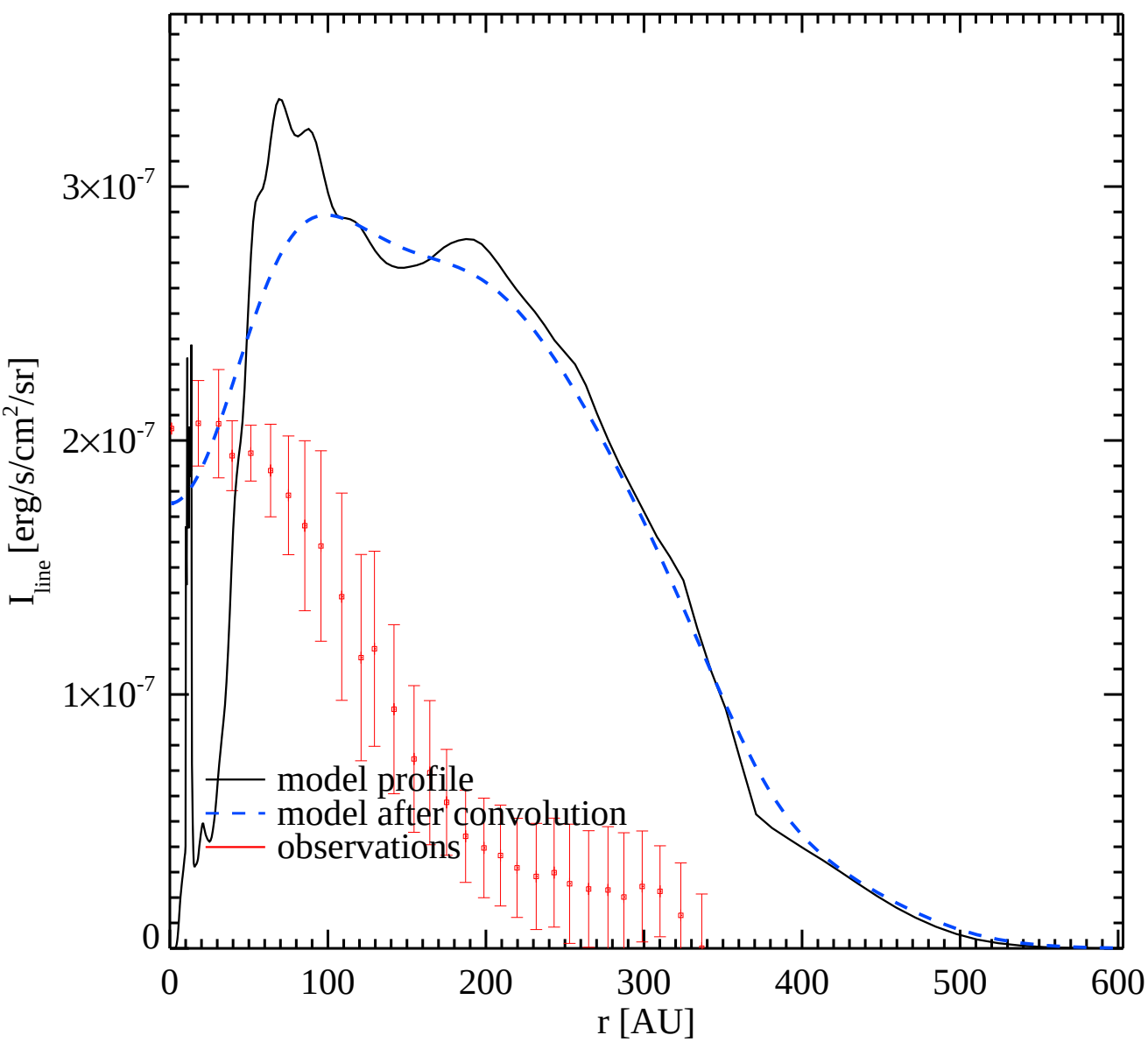

log I_line [erg/s/cm^2/sr]
10^-7
10^-8
0
100
200
300
400
500
r [AU]
model profile
model after convolution
observations

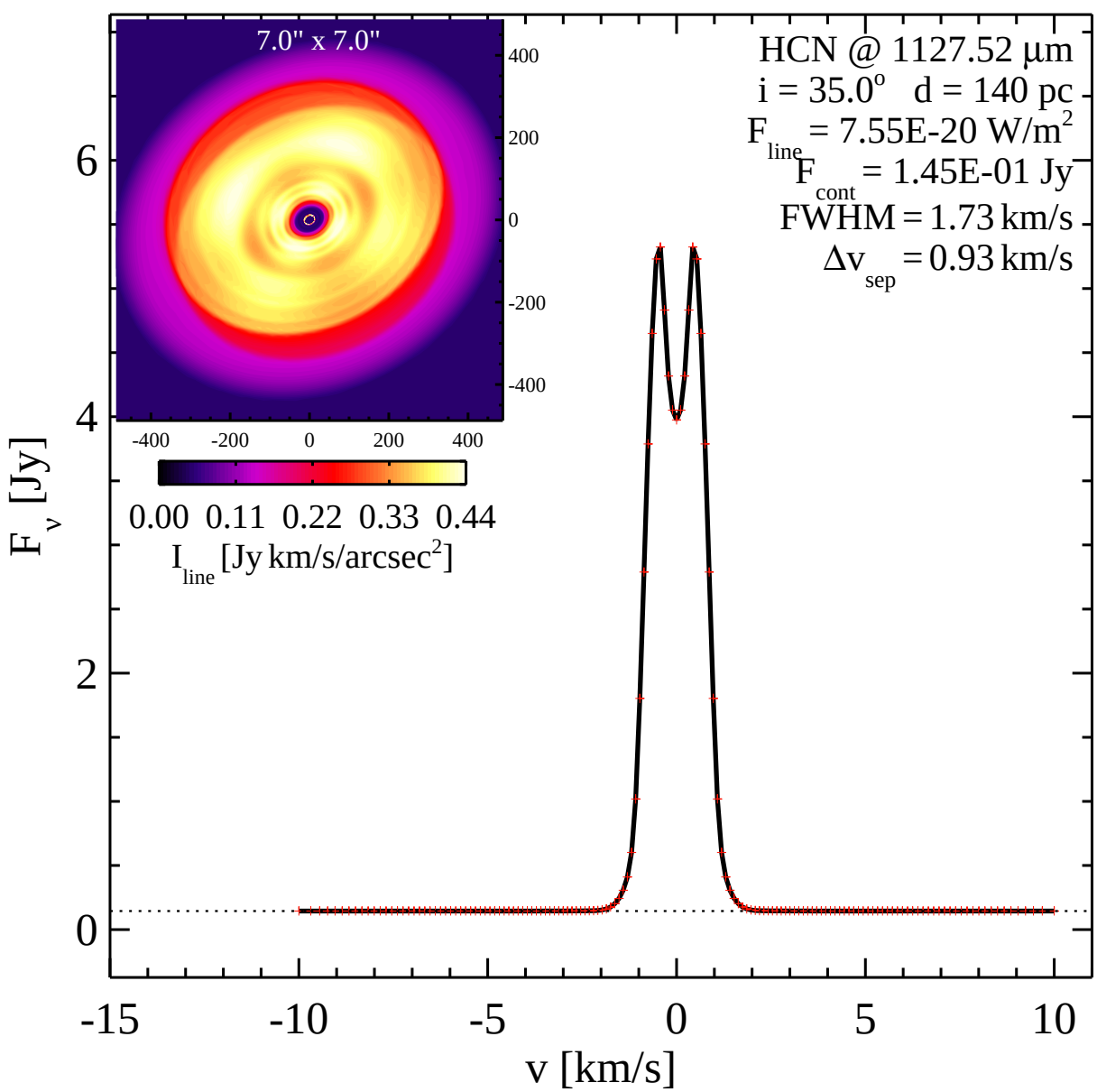

5×10-7
4×10-7
3×10-7
2×10-7
1×10-7
0
Iline [erg/s/cm2/sr]
0
100
200
300
400
500
r [AU]
model profile
model after convolution
observations

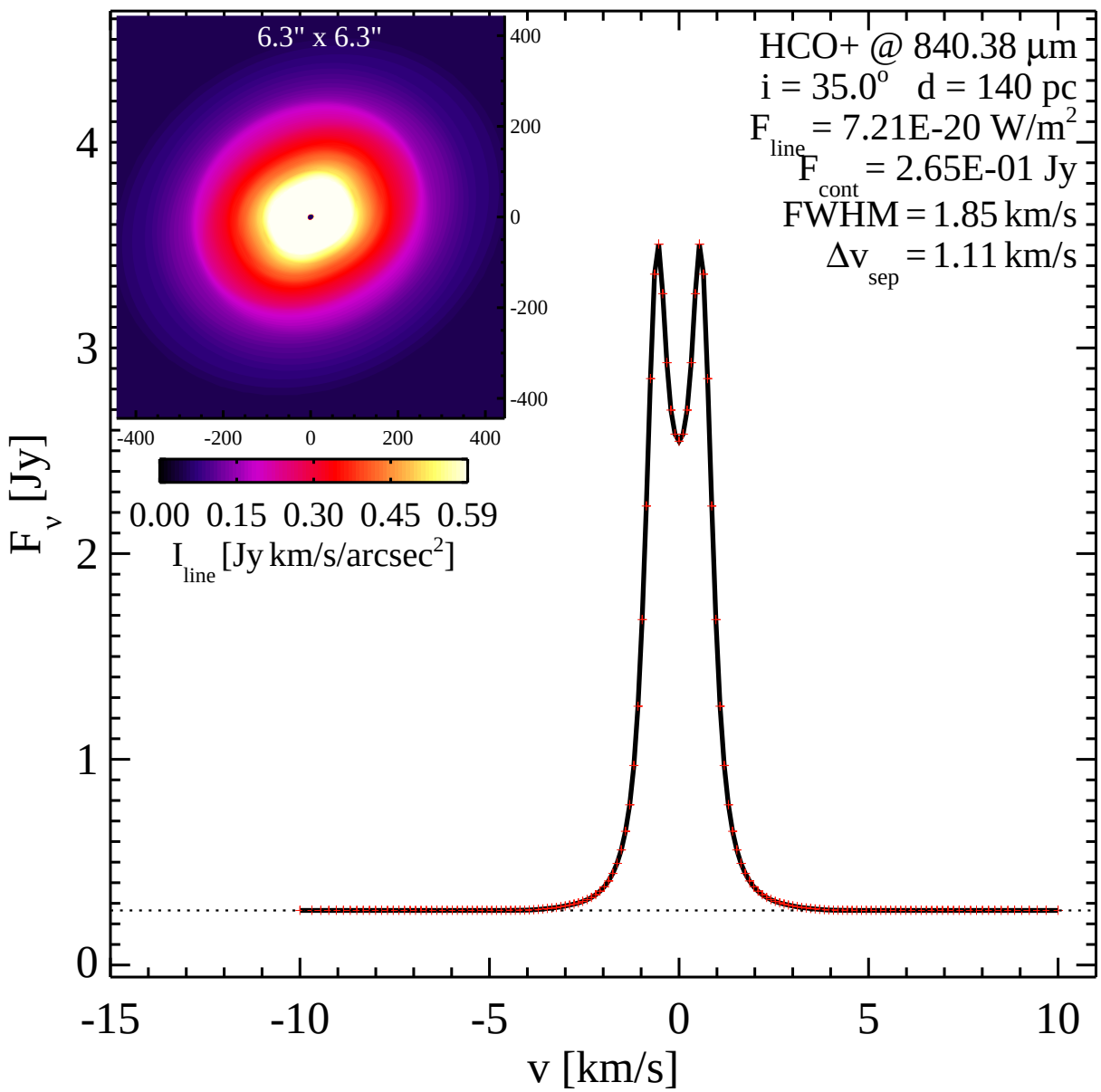

10.3" x 10.3"
600
400
200
0
-200
-400
-600
-600 -400 -200 0 200 400 600
0.00 0.08 0.17 0.25 0.33
I line [Jy km/s/arcsec2]
CN @ 1321.39 µm
i = 35.0o d = 140 pc
F line = 6.49E-20 W/m2
F cont = 1.00E-01 Jy
FWHM = 1.63 km/s
Δv sep = 0.85 km/s
F v [Jy]
0
2
4
6
-15 -10 -5 0 5 10
v [km/s]

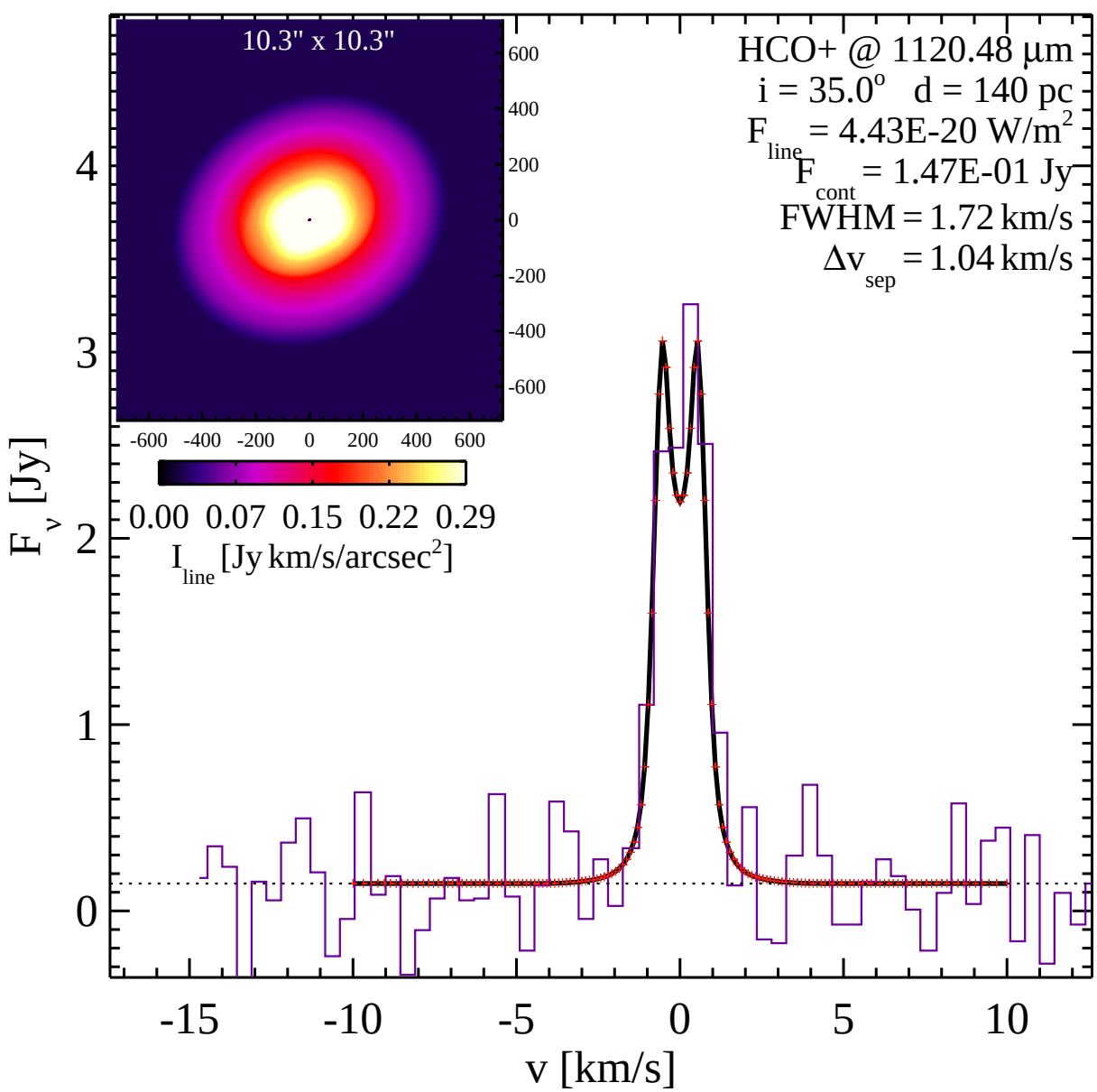

6.4" x 6.4"
400
200
0
-200
-400
-400 -200 0 200 400
0.00 0.15 0.30 0.44 0.59
I line [Jy km/s/arcsec2]
HCN @ 845.66 µm
i = 35.0o d = 140 pc
F line = 1.16E-19 W/m2
F cont = 2.62E-01 Jy
FWHM = 1.82 km/s
Δv sep = 1.01 km/s
F v [Jy]
0
2
4
6
-15 -10 -5 0 5 10
v [km/s]

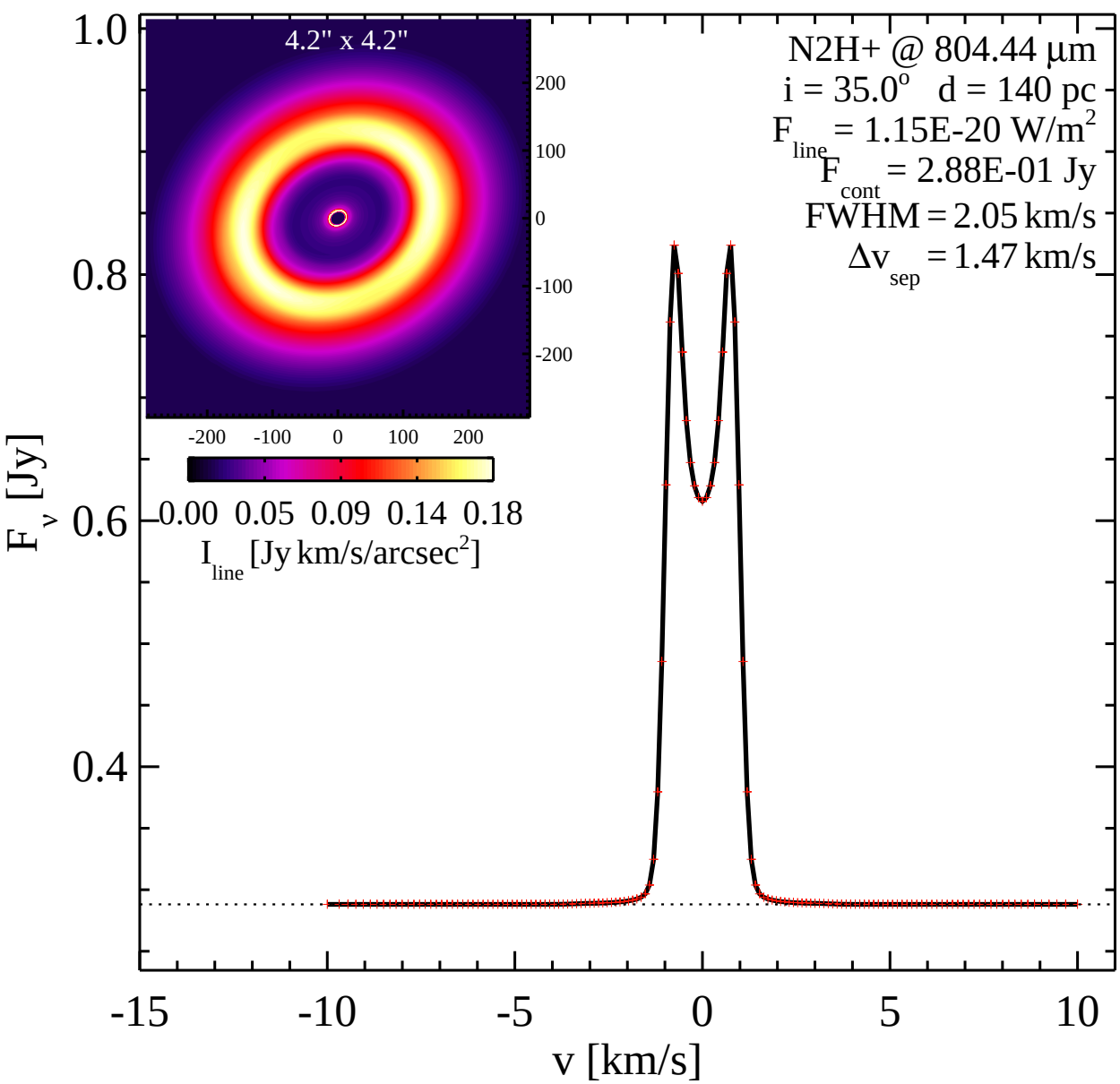

log I_line [erg/s/cm^2/sr]
10^-7
10^-8
10^-9
10^-10
0
100
200
300
400
500
600
r [AU]
model profile
model after convolution
observations

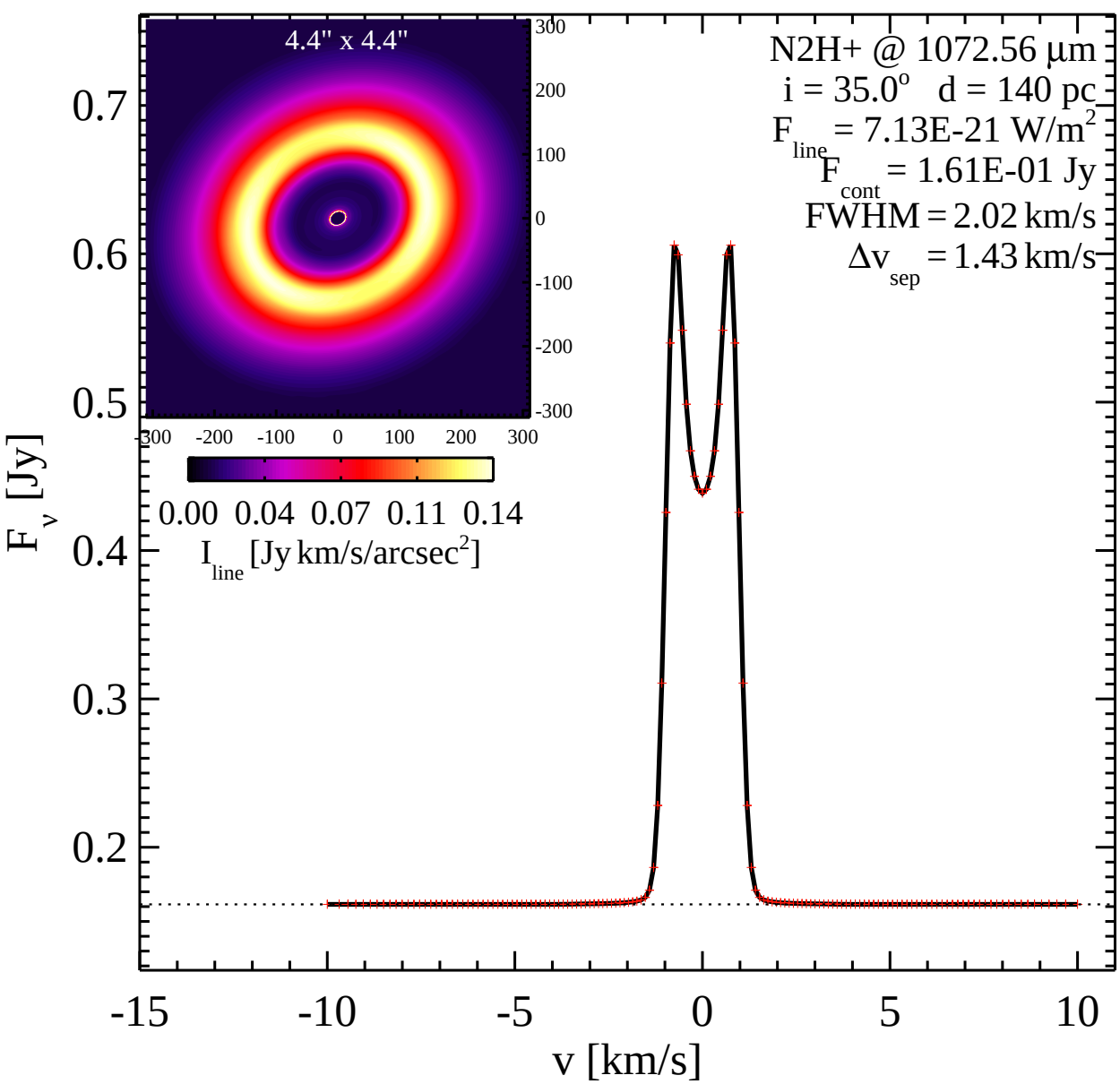

3×10-7
2×10-7
1×10-7
0
I line [erg/s/cm2/sr]
0
100
200
300
400
500
600
r [AU]
model profile
model after convolution
observations


7.0" x 7.0"
400
200
0
-200
-400
-400 -200 0 200 400
0.00 0.11 0.22 0.33 0.44
I line [Jy km/s/arcsec2]
HCN @ 1127.52 µm
i = 35.0o d = 140 pc
F line = 7.55E-20 W/m2
F cont = 1.45E-01 Jy
FWHM = 1.73 km/s
Δv sep = 0.93 km/s
F v [Jy]
0
2
4
6
-15 -10 -5 0 5 10
v [km/s]


6.3" x 6.3"
400
200
0
-200
-400
-400
-200
0
200
400
0.00 0.15 0.30 0.45 0.59
I line [Jy km/s/arcsec2]
HCO+ @ 840.38 µm
i = 35.0o d = 140 pc
F line = 7.21E-20 W/m2
F cont = 2.65E-01 Jy
FWHM = 1.85 km/s
Δv sep = 1.11 km/s
F v [Jy]
0
1
2
3
4
-15
-10
-5
0
5
10
v [km/s]


10.3" x 10.3"
600
400
200
0
-200
-400
-600
-600 -400 -200 0 200 400 600
0.00 0.07 0.15 0.22 0.29
I line [Jy km/s/arcsec2]
HCO+ @ 1120.48 µm
i = 35.0o d = 140 pc
F line = 4.43E-20 W/m2
F cont = 1.47E-01 Jy
FWHM = 1.72 km/s
Δv sep = 1.04 km/s
F v [Jy]
0
1
2
3
4
-15
-10
-5
0
5
10
v [km/s]


4.2" x 4.2"
200
100
0
-100
-200
-200 -100 0 100 200
0.00 0.05 0.09 0.14 0.18
I line [Jy km/s/arcsec2]
N2H+ @ 804.44 µm
i = 35.0o d = 140 pc
F line = 1.15E-20 W/m2
F cont = 2.88E-01 Jy
FWHM = 2.05 km/s
Δv sep = 1.47 km/s
F v [Jy]
1.0
0.8
0.6
0.4
-15 -10 -5 0 5 10
v [km/s]


4.4" x 4.4"
N2H+ @ 1072.56 µm
i = 35.0° d = 140 pc
F line = 7.13E-21 W/m2
F cont = 1.61E-01 Jy
FWHM = 2.02 km/s
Δv sep = 1.43 km/s
0.00 0.04 0.07 0.11 0.14
I line [Jy km/s/arcsec2]
F v [Jy]
v [km/s]