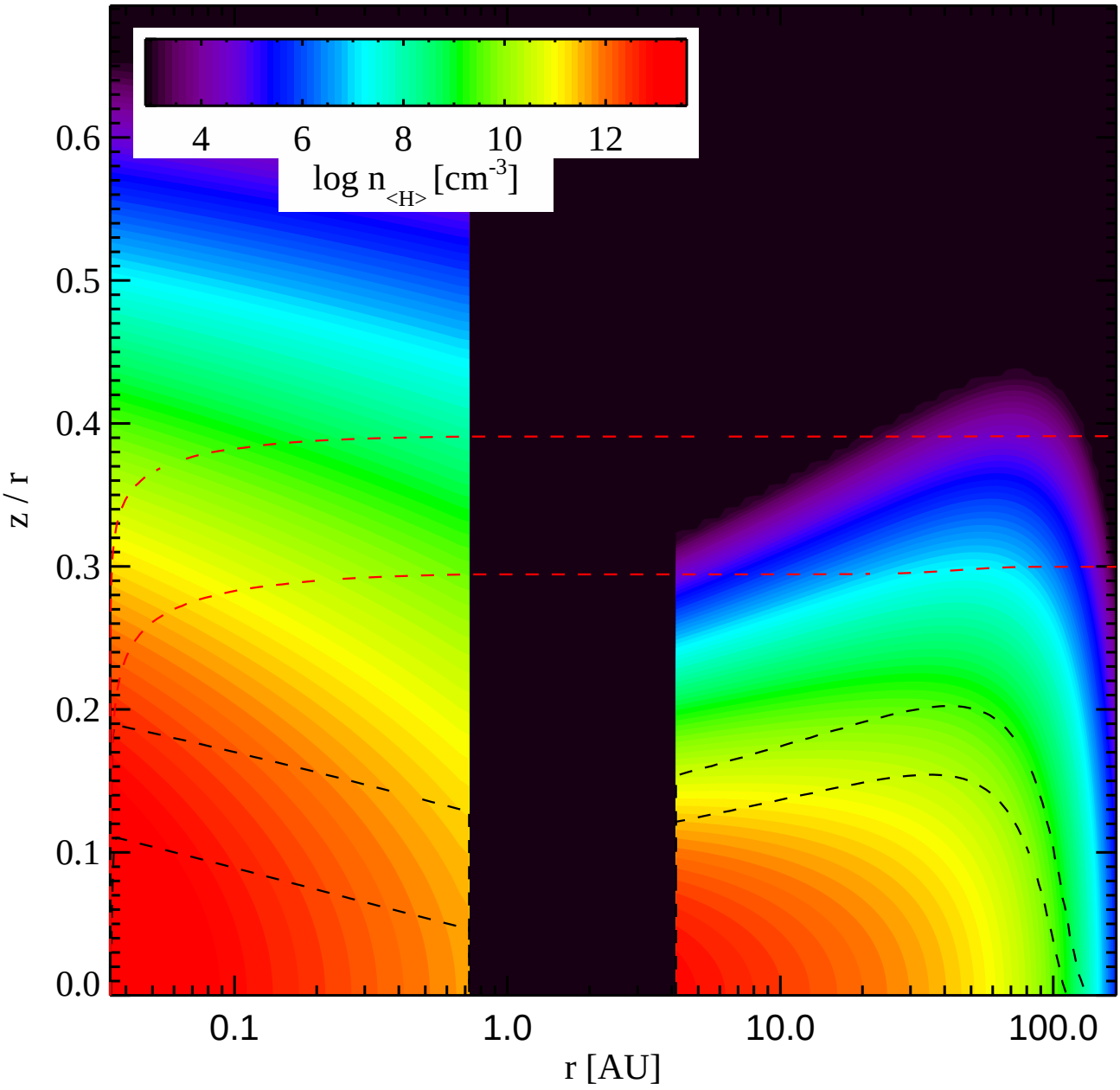
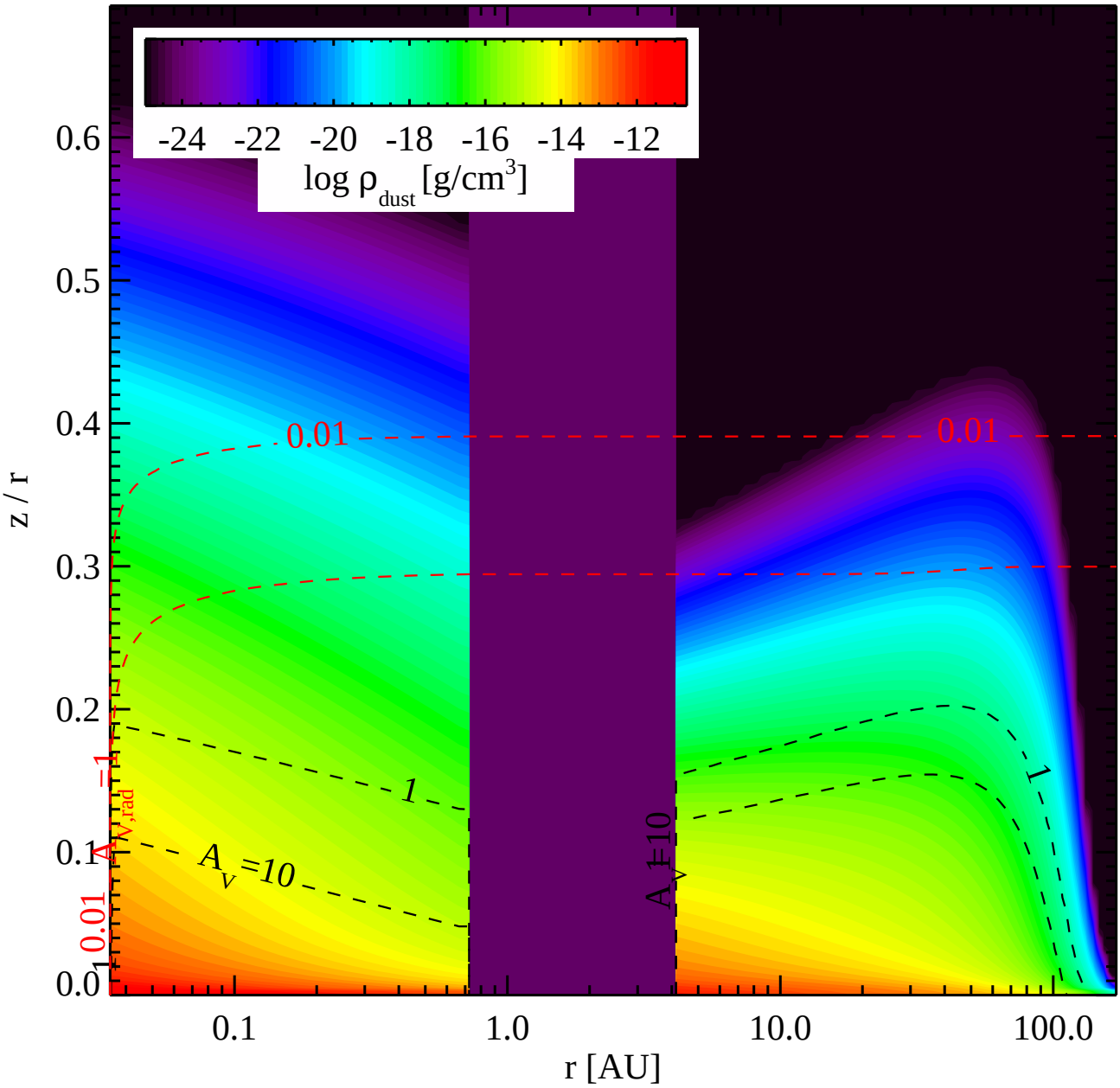
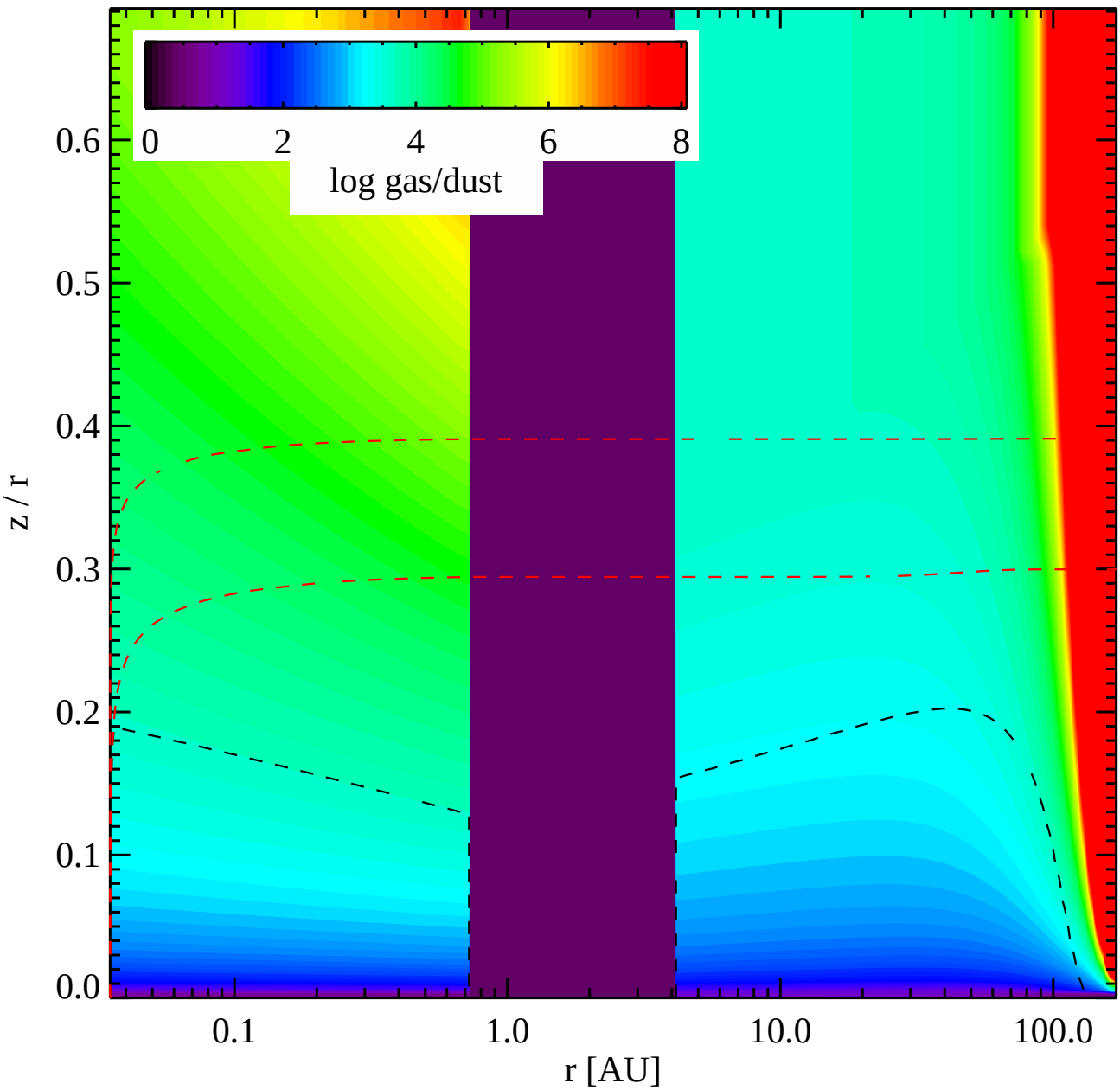
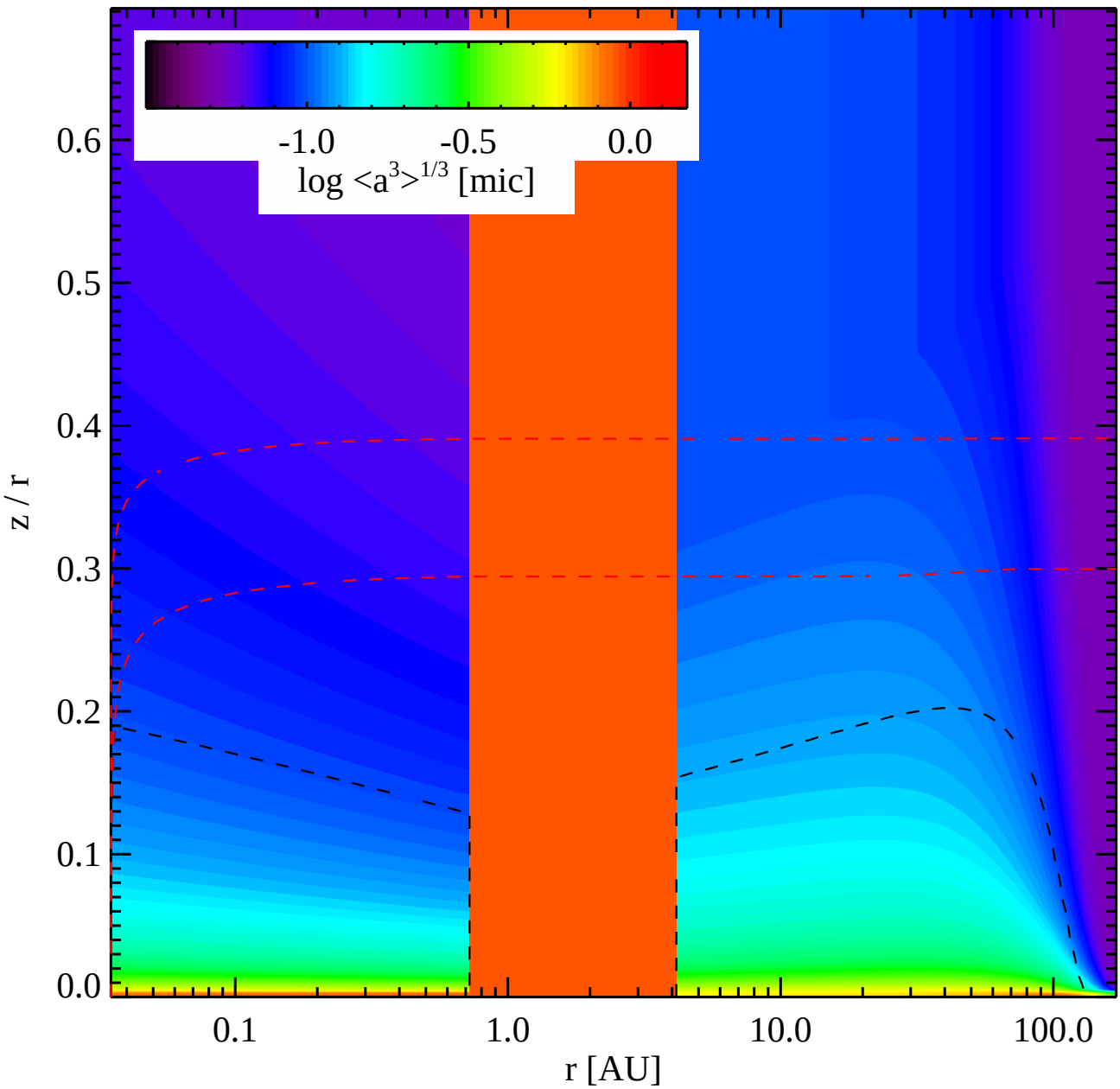
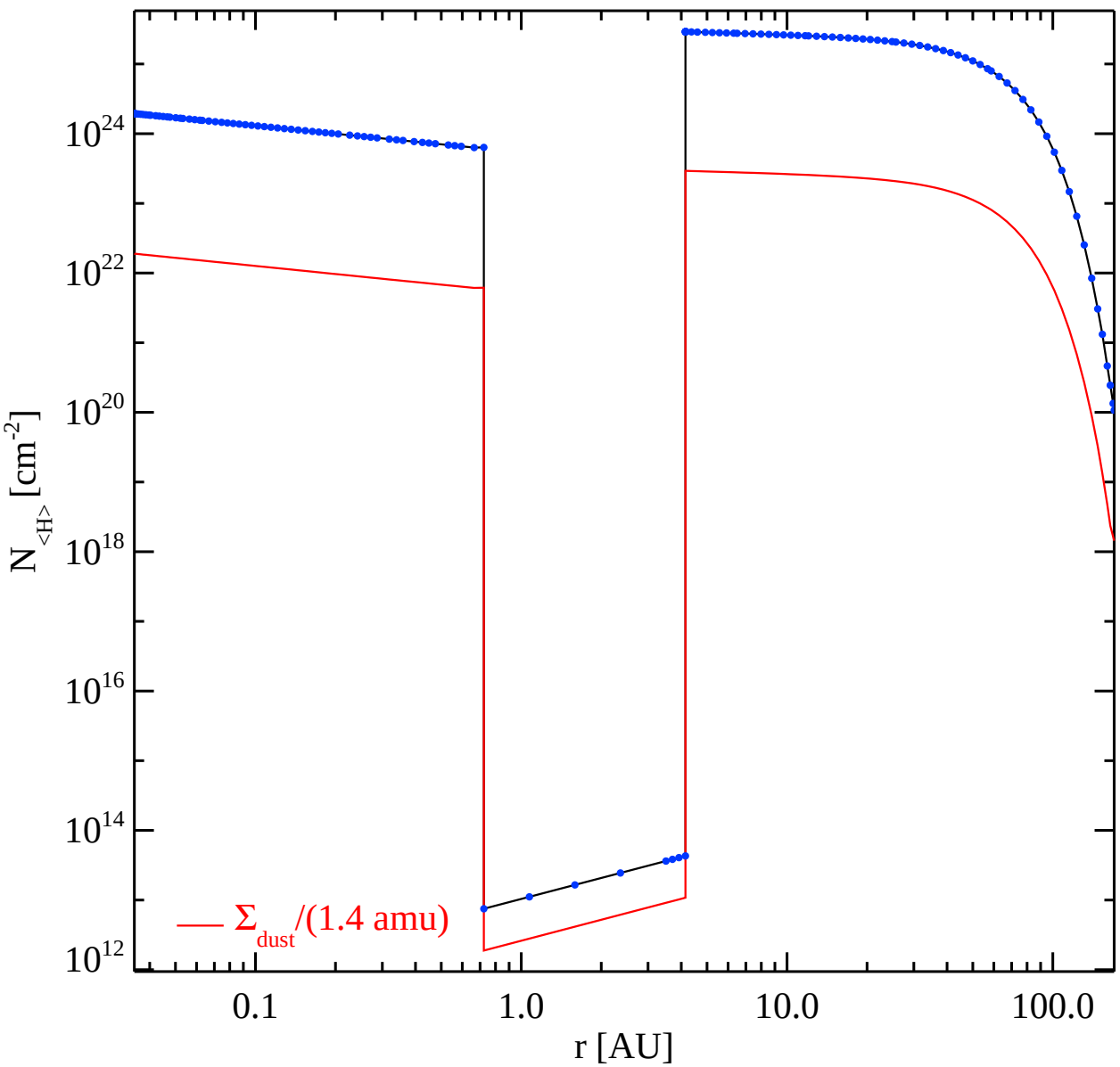
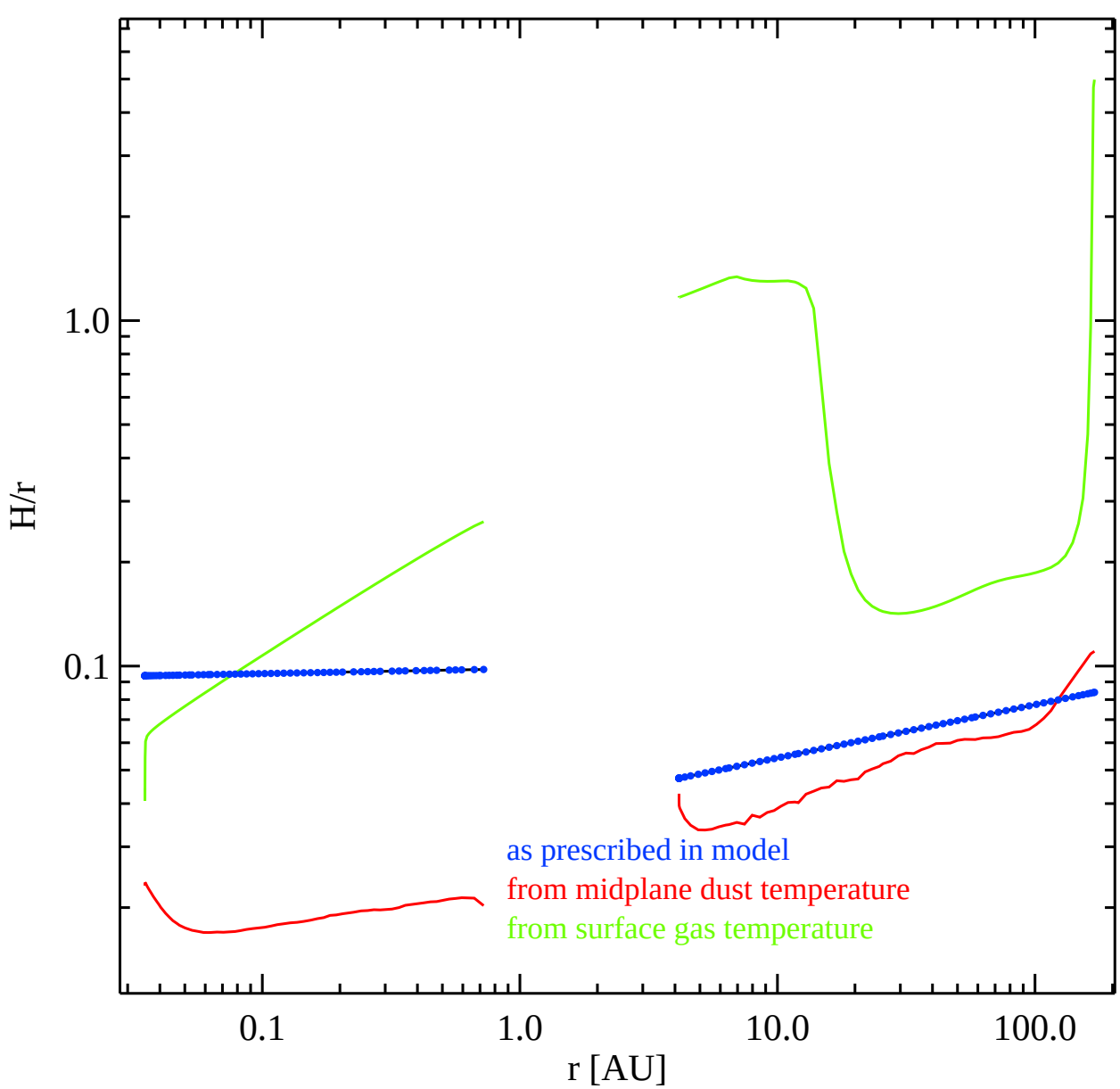

4
6
8
10
12
log n<H> [cm-3]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

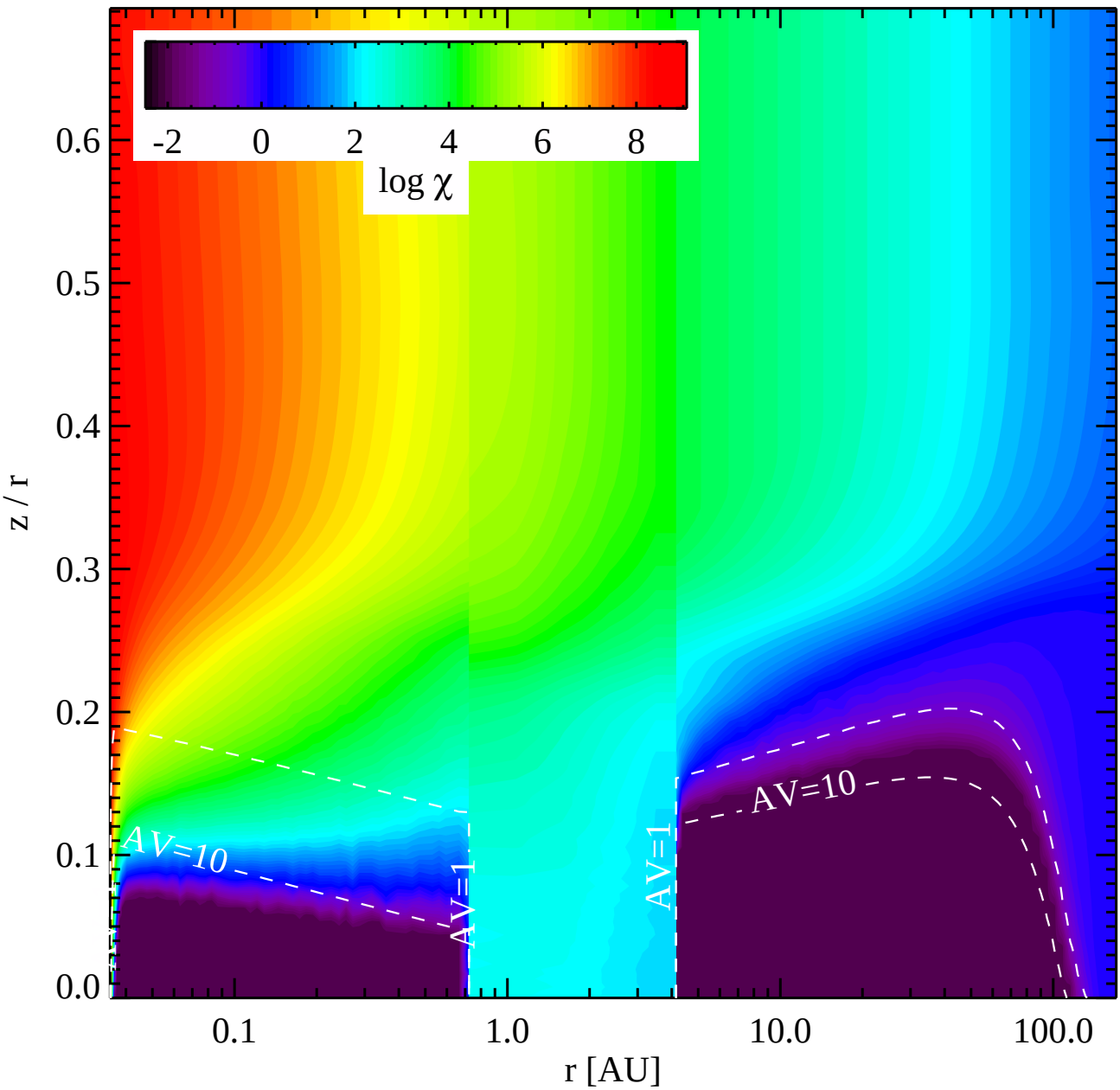

-24 -22 -20 -18 -16 -14 -12
log ρ dust [g/cm3]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.01
0.01
1
1
A V =10
A V =10
A V,rad =1
A V,rad =0.01
0.1
1.0
10.0
100.0
r [AU]

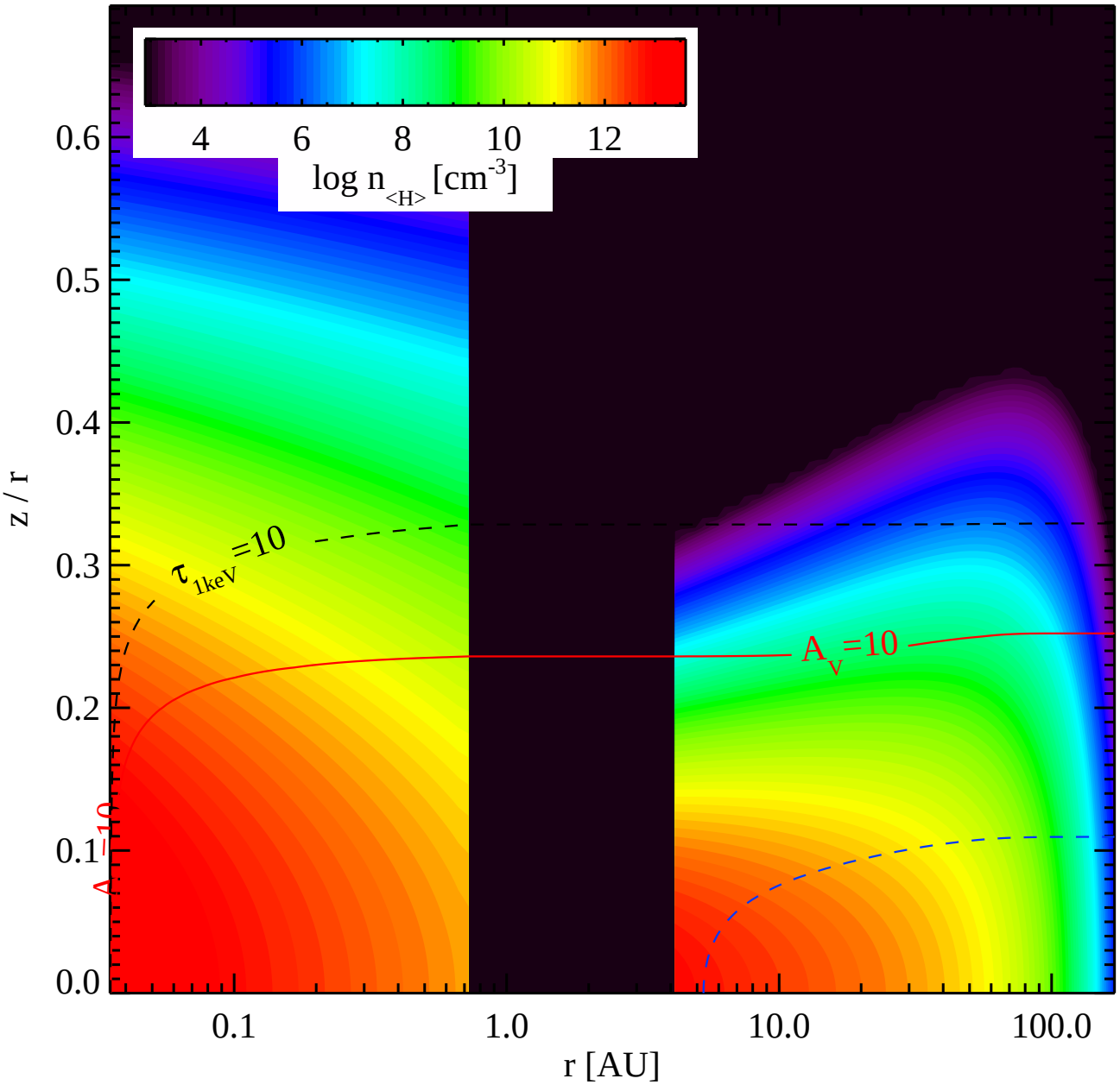

0
2
4
6
8
log gas/dust
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

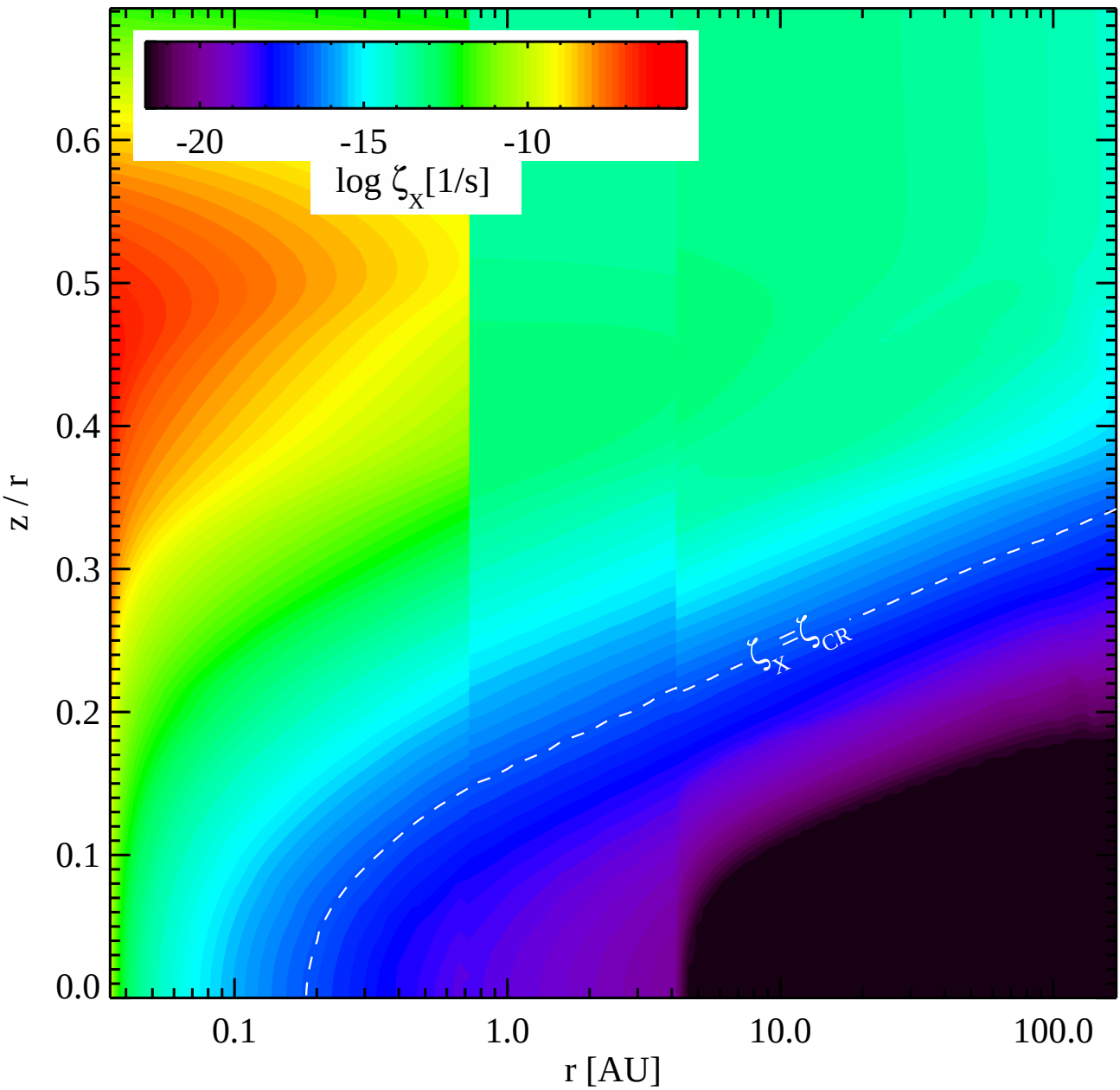

-1.0
-0.5
0.0
log <a^3>^1/3 [mic]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

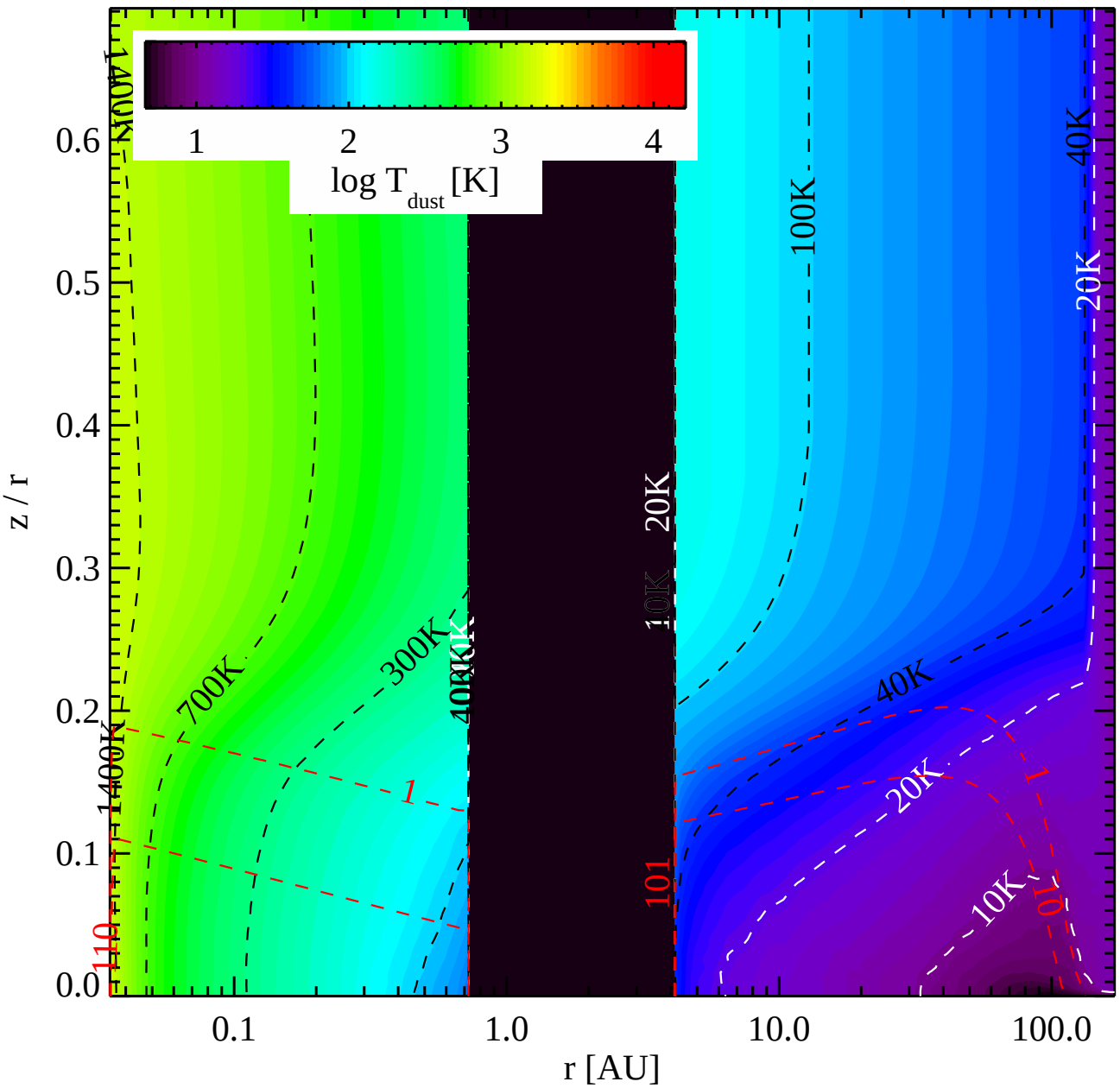

10^{24}
10^{22}
10^{20}
10^{18}
10^{16}
10^{14}
10^{12}
$N_{<H>}$ [cm^{-2}]
0.1
1.0
10.0
100.0
r [AU]
Σ_{dust}/(1.4 amu)


1.0
0.1
H/r
0.1
1.0
10.0
100.0
r [AU]
as prescribed in model
from midplane dust temperature
from surface gas temperature

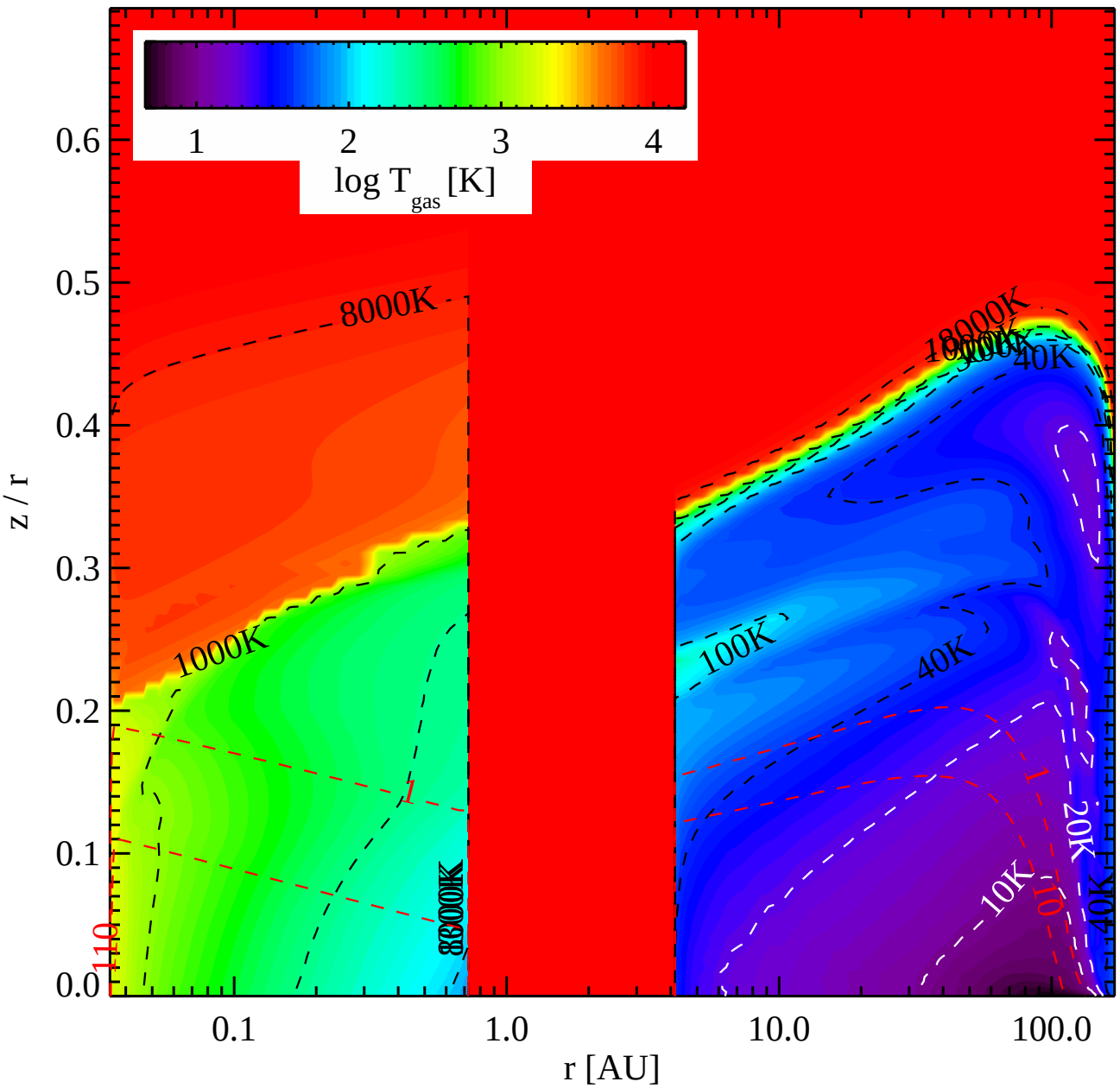

-2
0
2
4
6
8
log χ
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
AV=10
AV=1
AV=1
AV=10
0.1
1.0
10.0
100.0
r [AU]

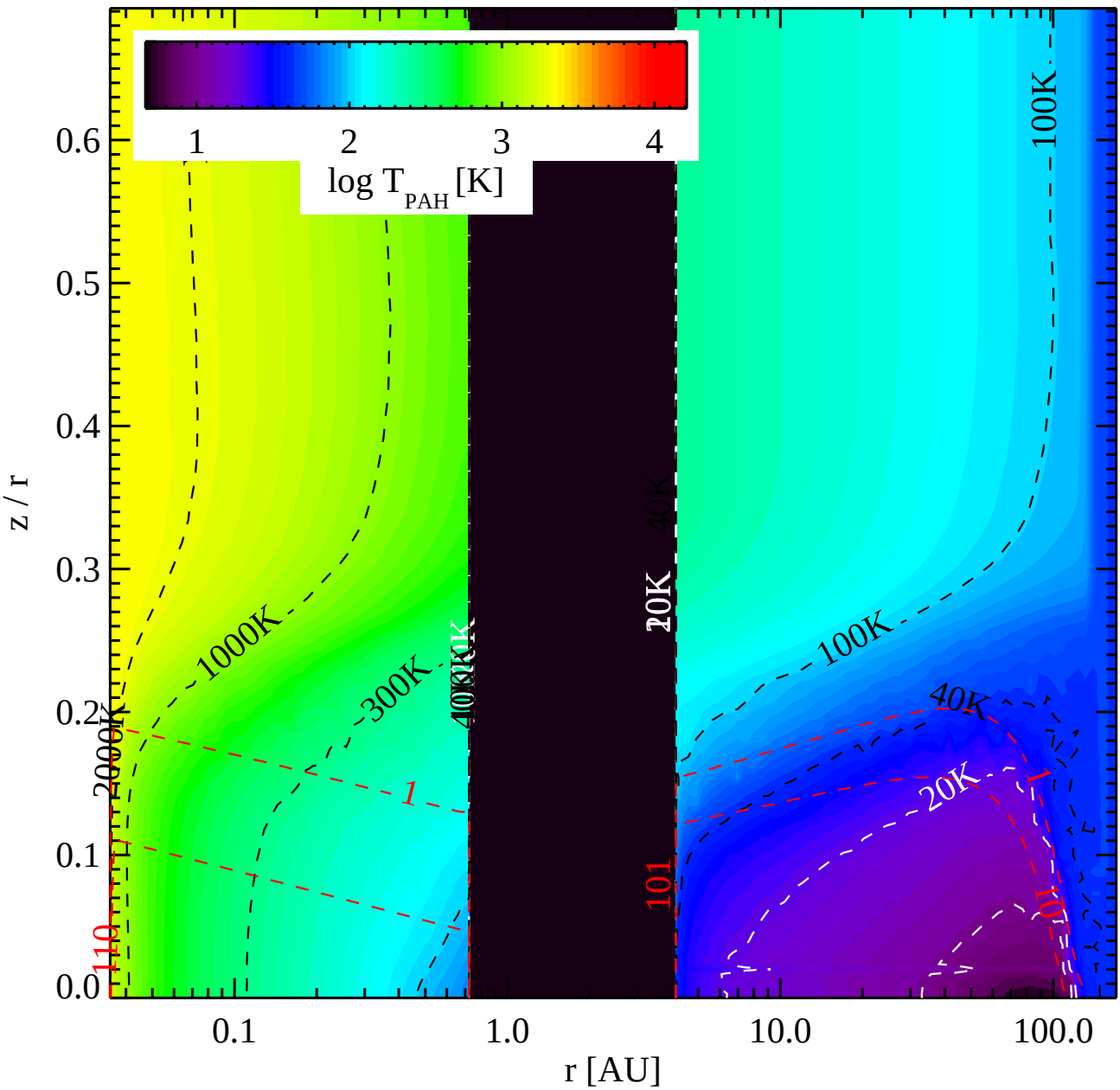

4
6
8
10
12
log n<H> [cm-3]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
τ1keV=10
AV=10
AV=10
0.1
1.0
10.0
100.0
r [AU]


-20
-15
-10
log ζX[1/s]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]
ζX=ζCR

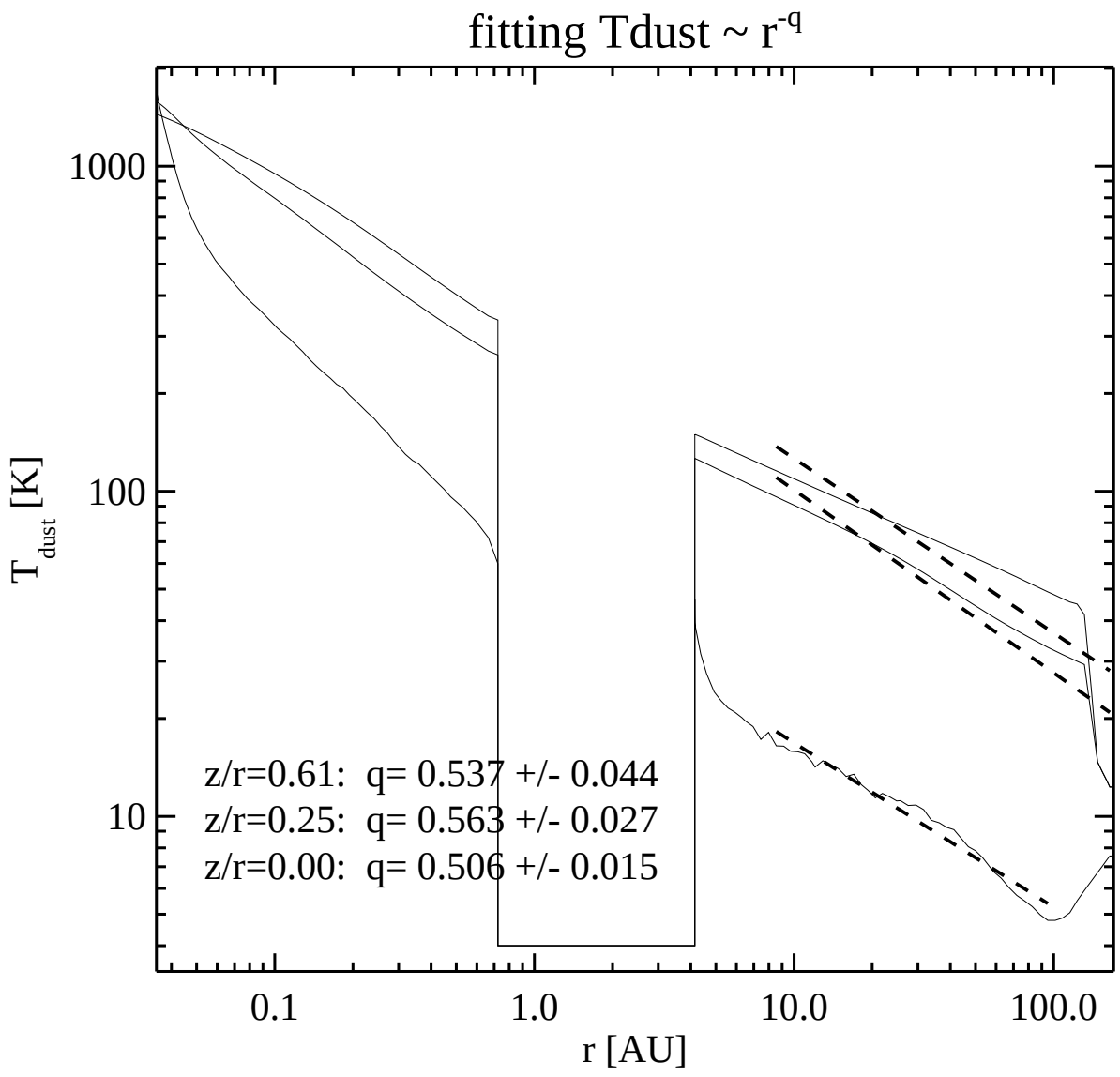


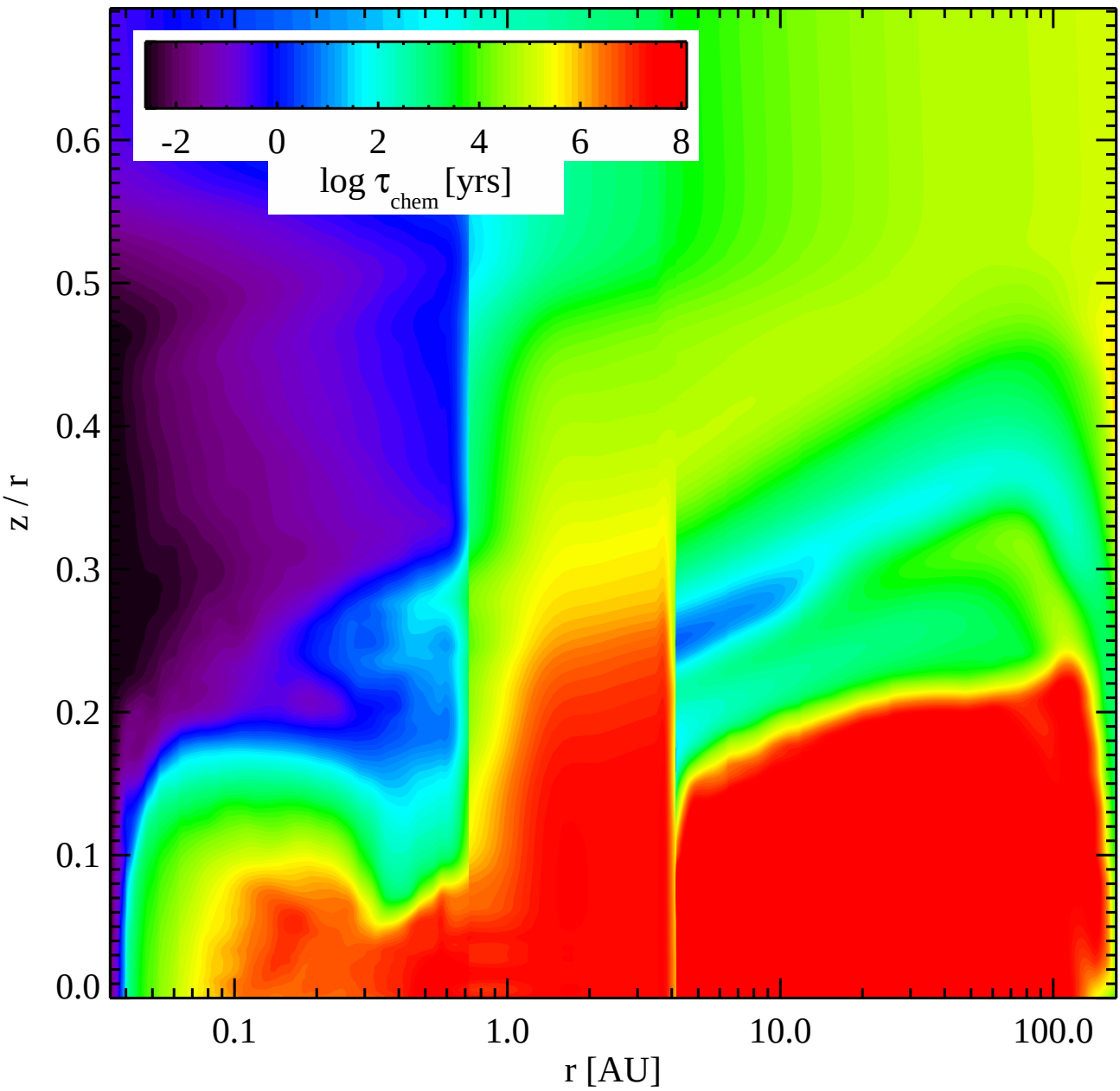
log T dust [K]
1
2
3
4
z / r
r [AU]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.1
1.0
10.0
100.0
1400K
700K
300K
100K
40K
20K
10K
110
101

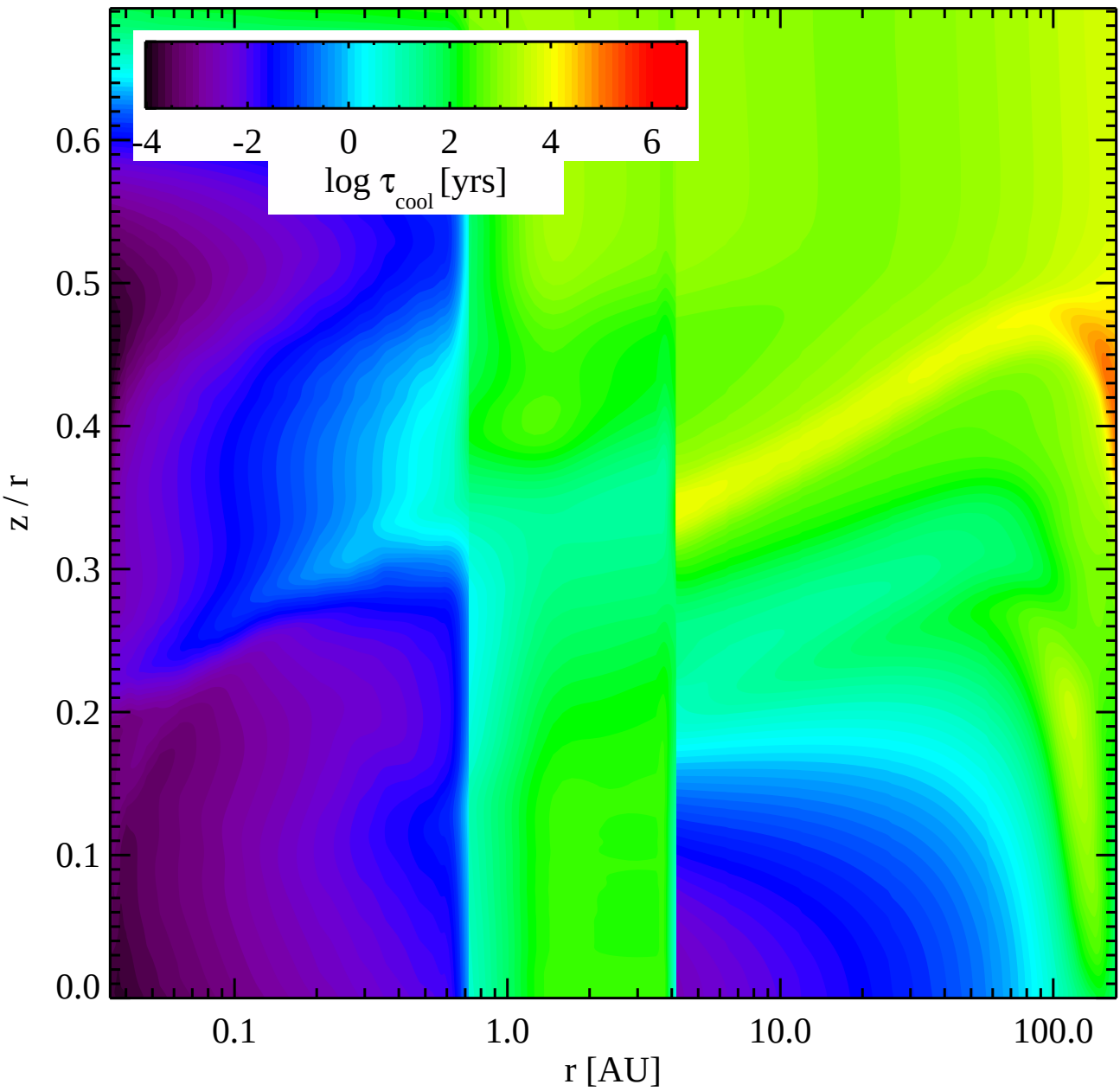

1
2
3
4
log T gas [K]
8000K
1000K
100K
40K
20K
10K
1
10
0.0
0.1
0.2
0.3
0.4
0.5
0.6
z / r
0.1
1.0
10.0
100.0
r [AU]

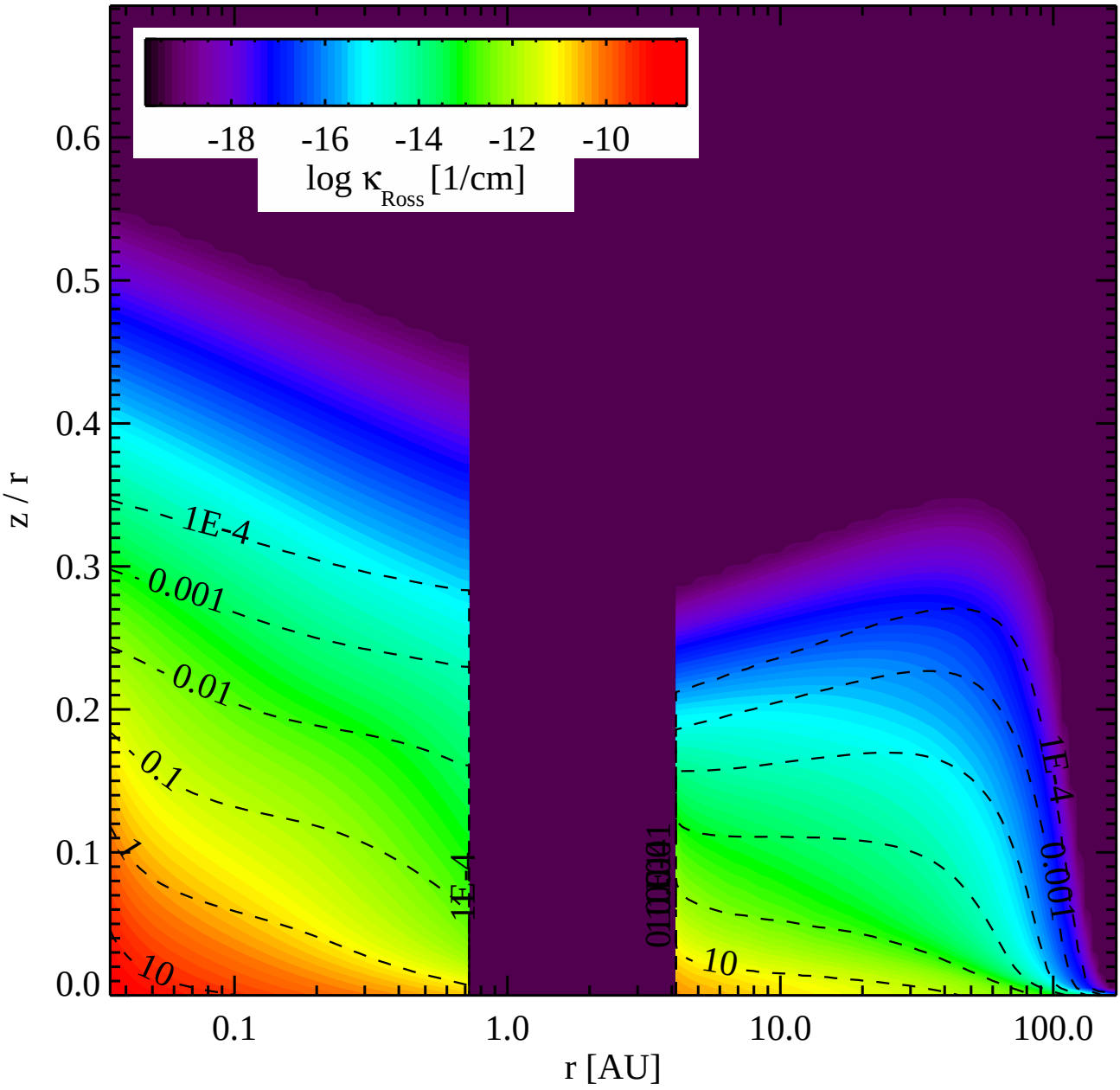


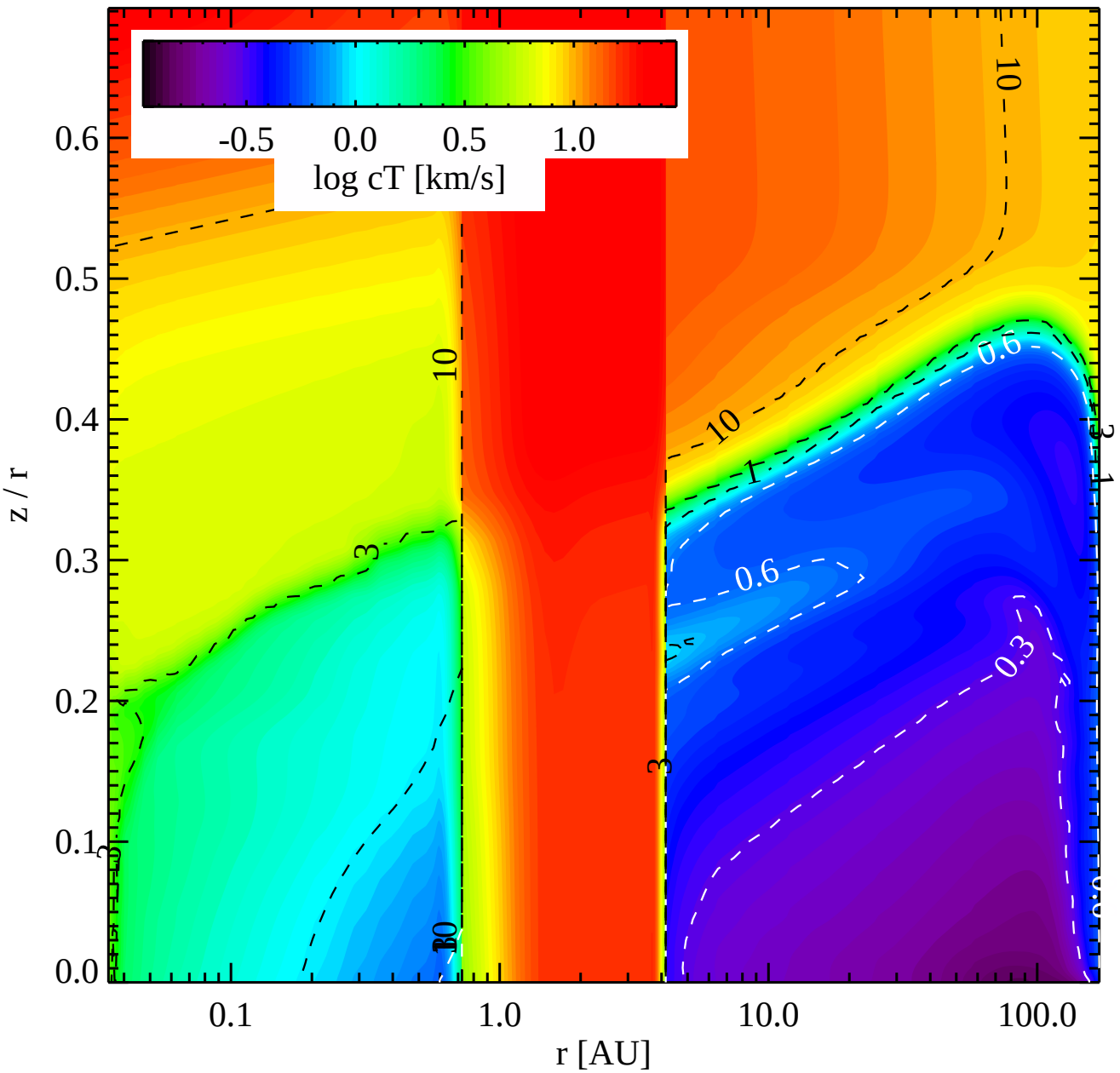
1
2
3
4
log T_PAH [K]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]
1000K
300K
2000K
100K
40K
20K
1
110
101

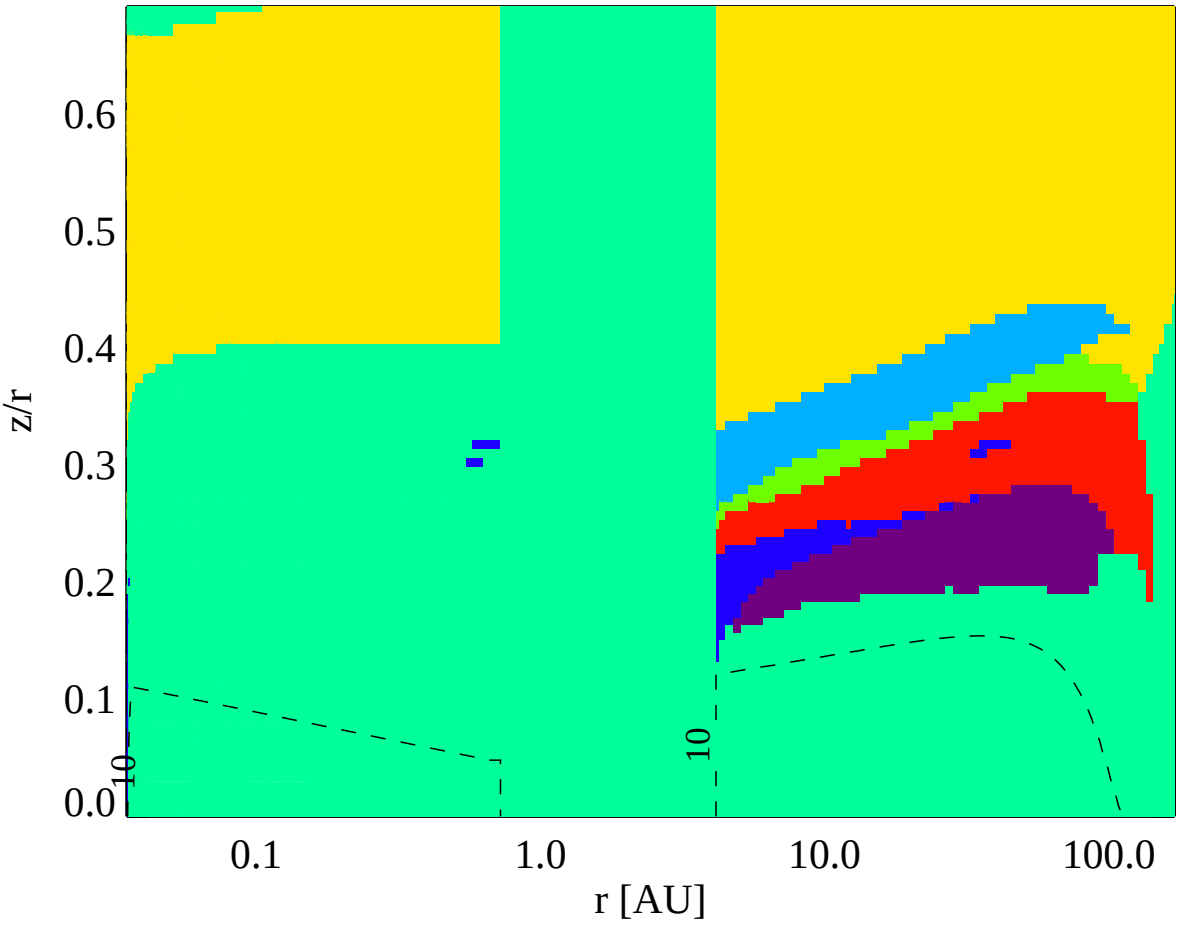

fitting Tdust ~ r^-q
1000
100
10
T dust [K]
0.1
1.0
10.0
100.0
r [AU]
z/r=0.61: q= 0.537 +/- 0.044
z/r=0.25: q= 0.563 +/- 0.027
z/r=0.00: q= 0.506 +/- 0.015


-2
0
2
4
6
8
log τ chem [yrs]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

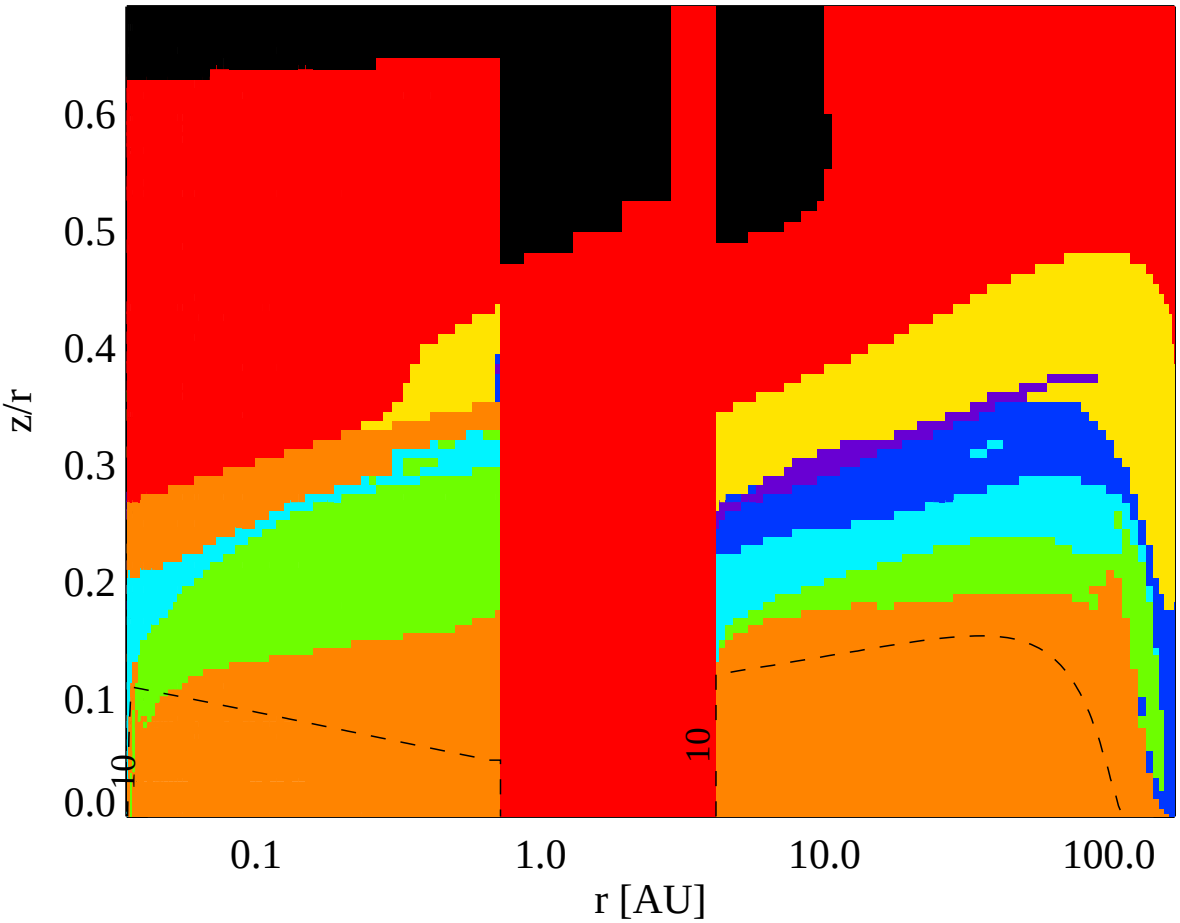

-4
-2
0
2
4
6
log τ cool [yrs]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]


-18
-16
-14
-12
-10
log κ Ross [1/cm]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
1E-4
0.001
0.01
0.1
1
10
0.1
1.0
10.0
100.0
r [AU]

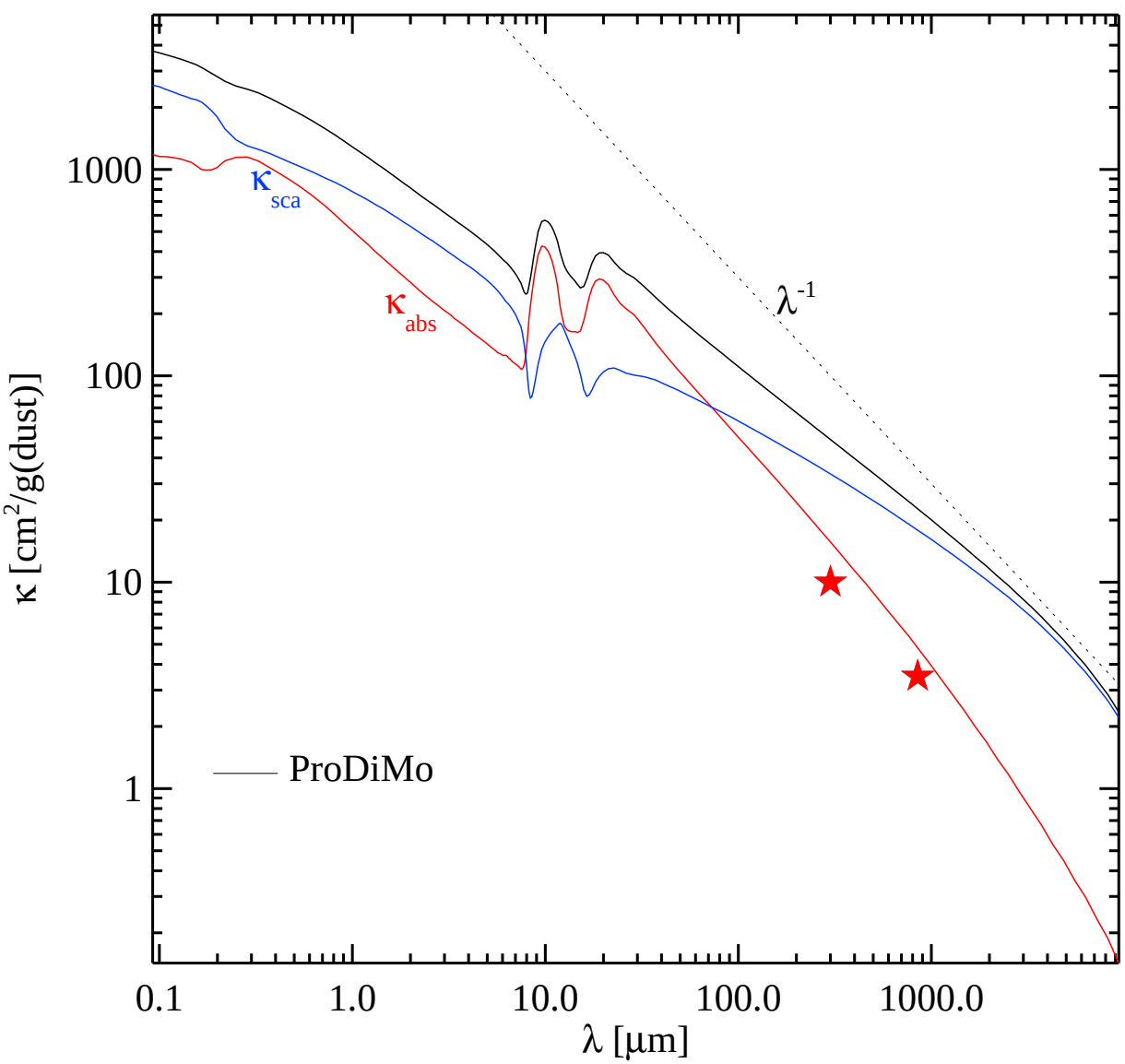

-0.5
0.0
0.5
1.0
log cT [km/s]
z / r
r [AU]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.1
1.0
10.0
100.0
10
10
10
3
3
3
1
1
0.6
0.6
0.3

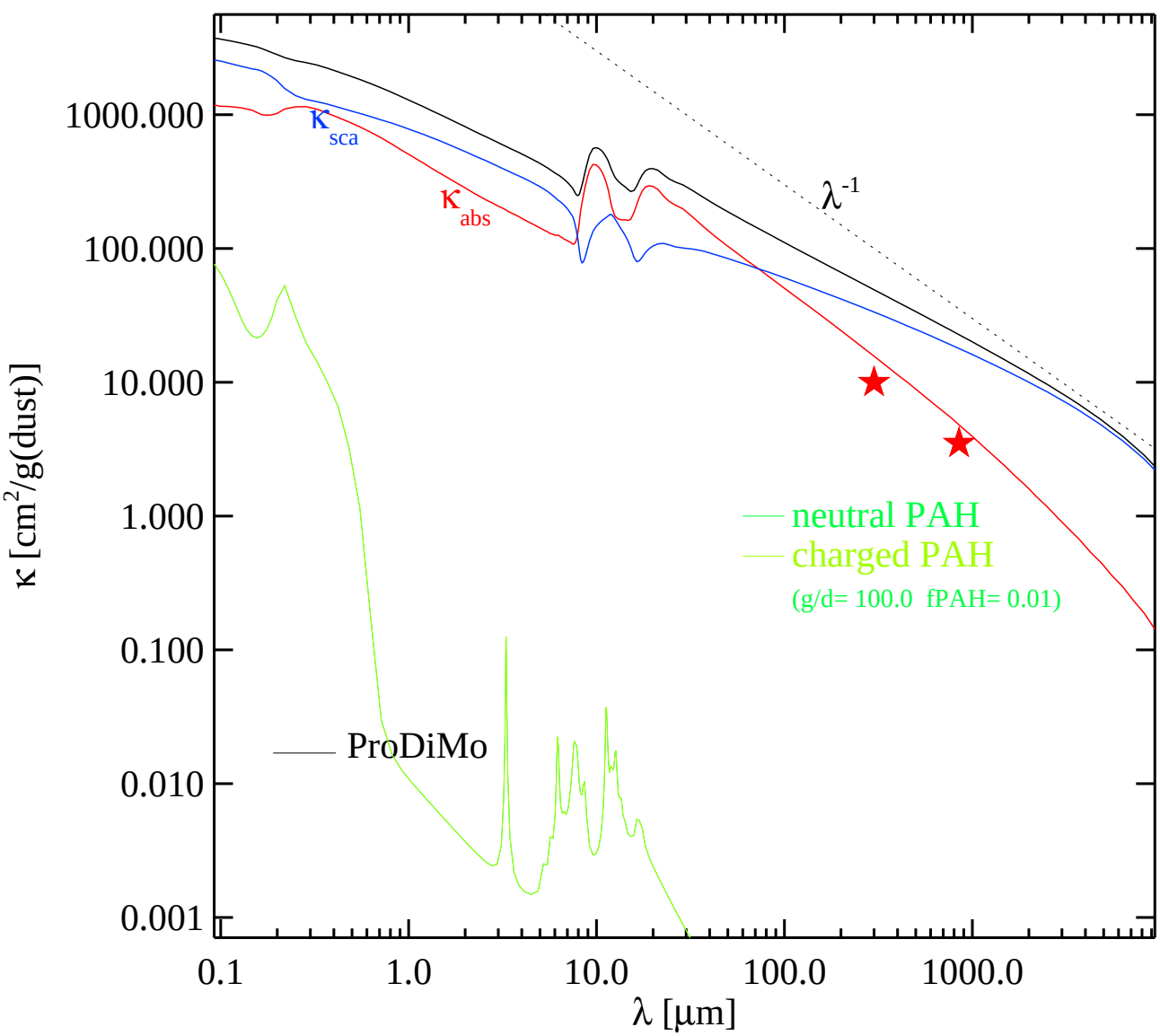


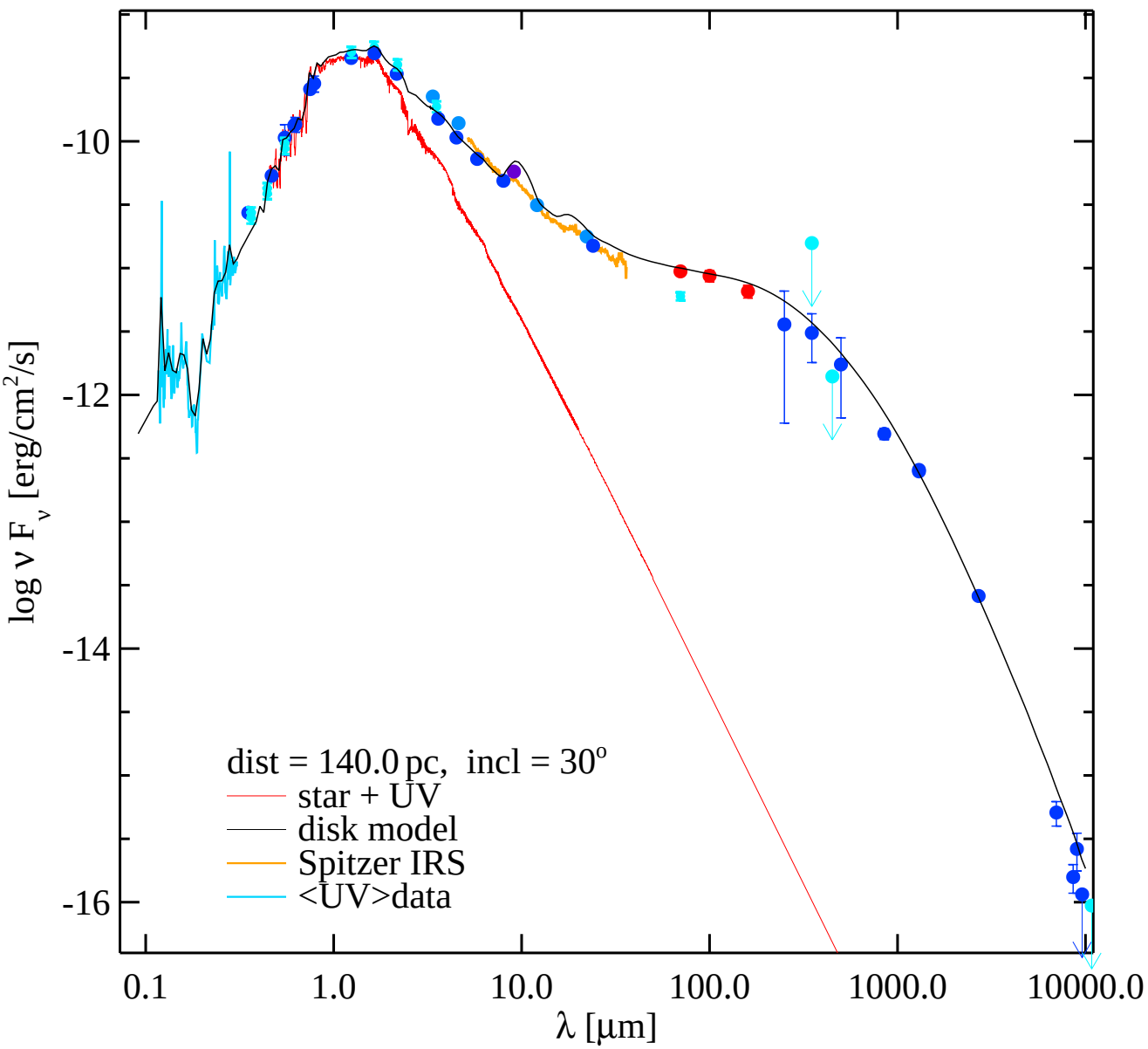
heating by thermal accomodation on grains
IR background heating by CO ro-vib
background heating by CII
viscous heating
background heating by CI
X-ray Coulomb heating
chemical heating

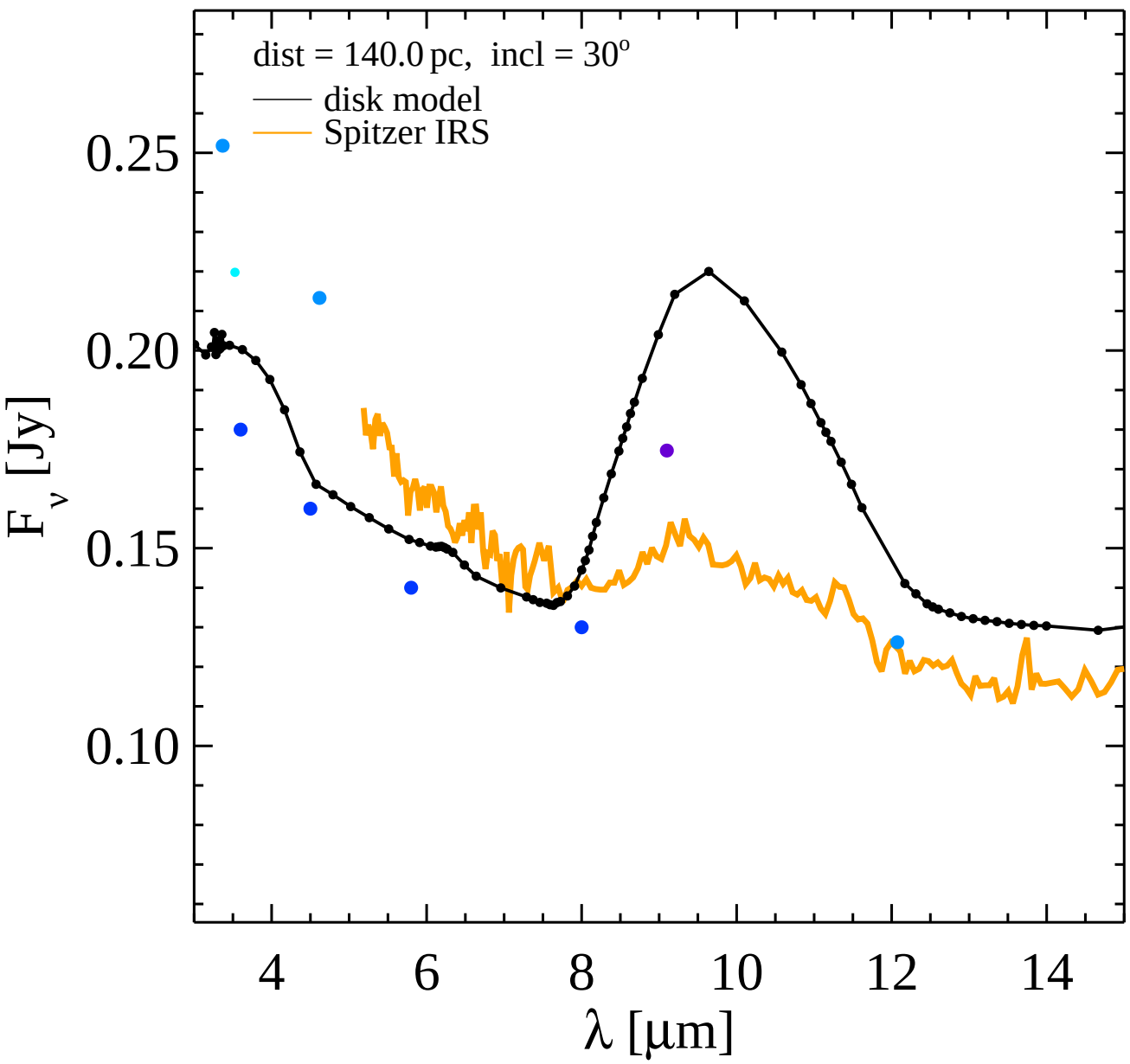


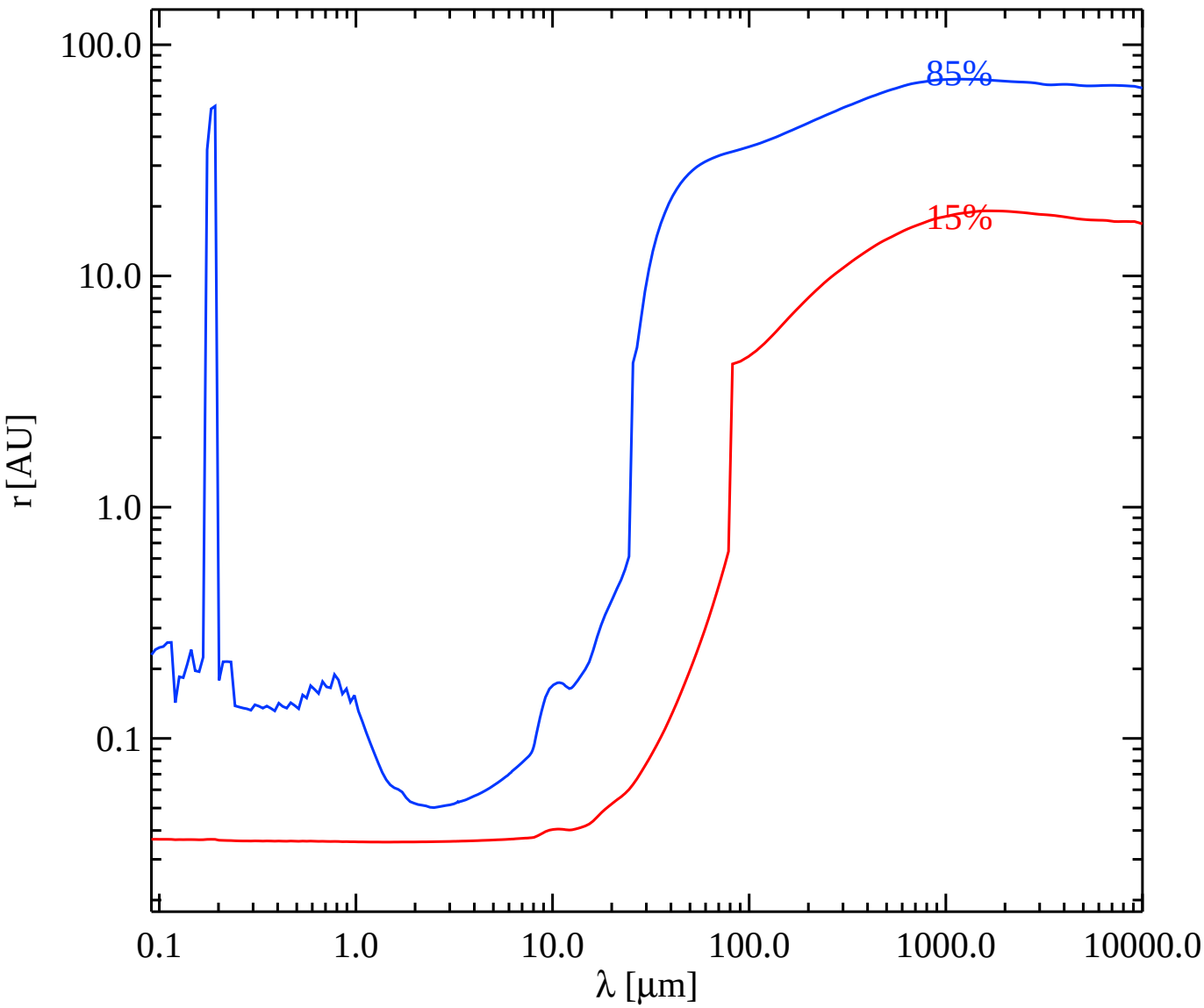
CII line cooling
cooling by thermal accomodation on grains
Ly-alpha line cooling
CI line cooling
OI line cooling
CO rot & ro-vib cooling
H2O rot and rovib cooling
OIII line cooling

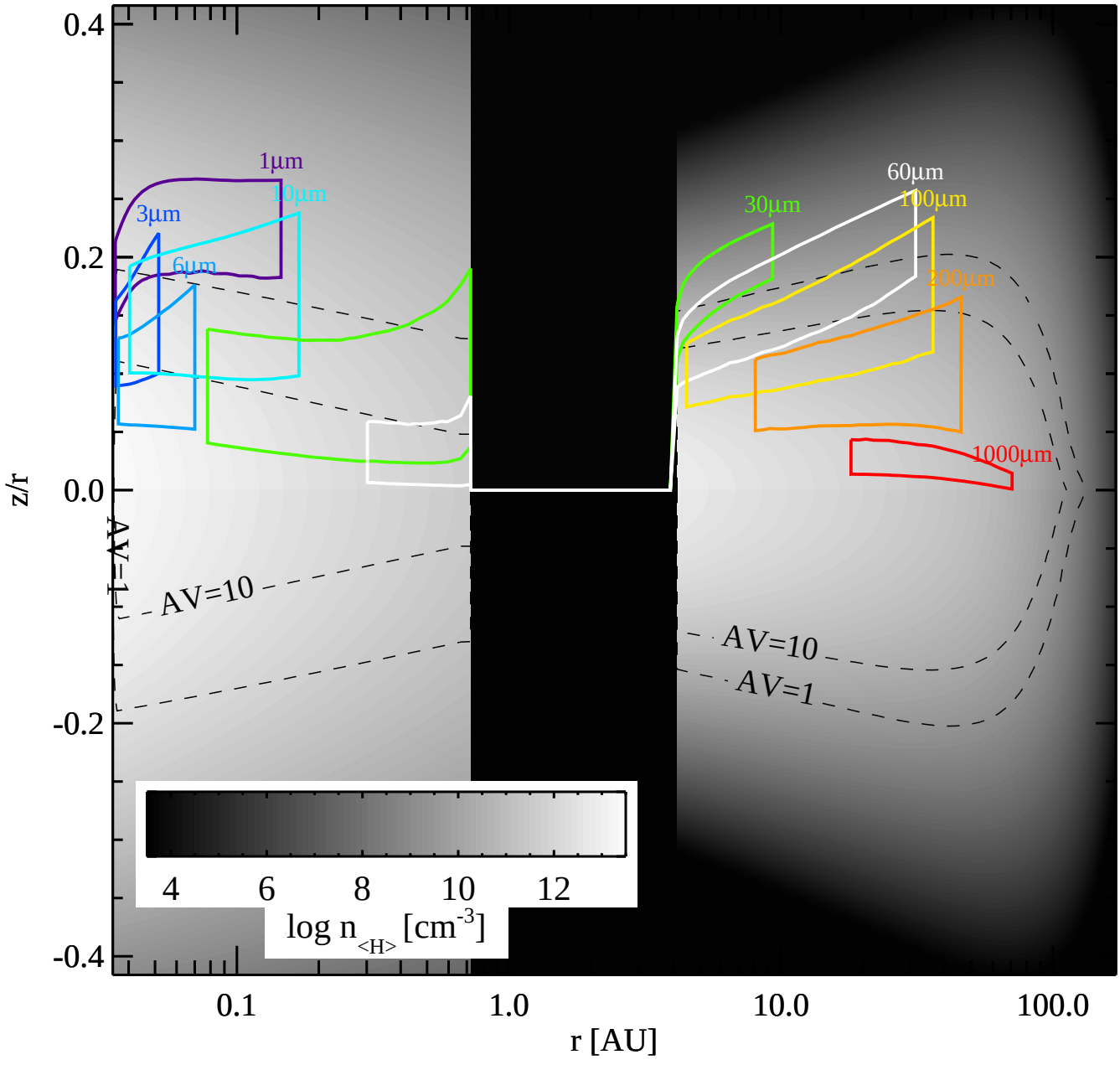

1000
100
10
1
κ [cm²/g(dust)]
κsca
κabs
λ-1
ProDiMo
0.1
1.0
10.0
100.0
1000.0
λ [μm]

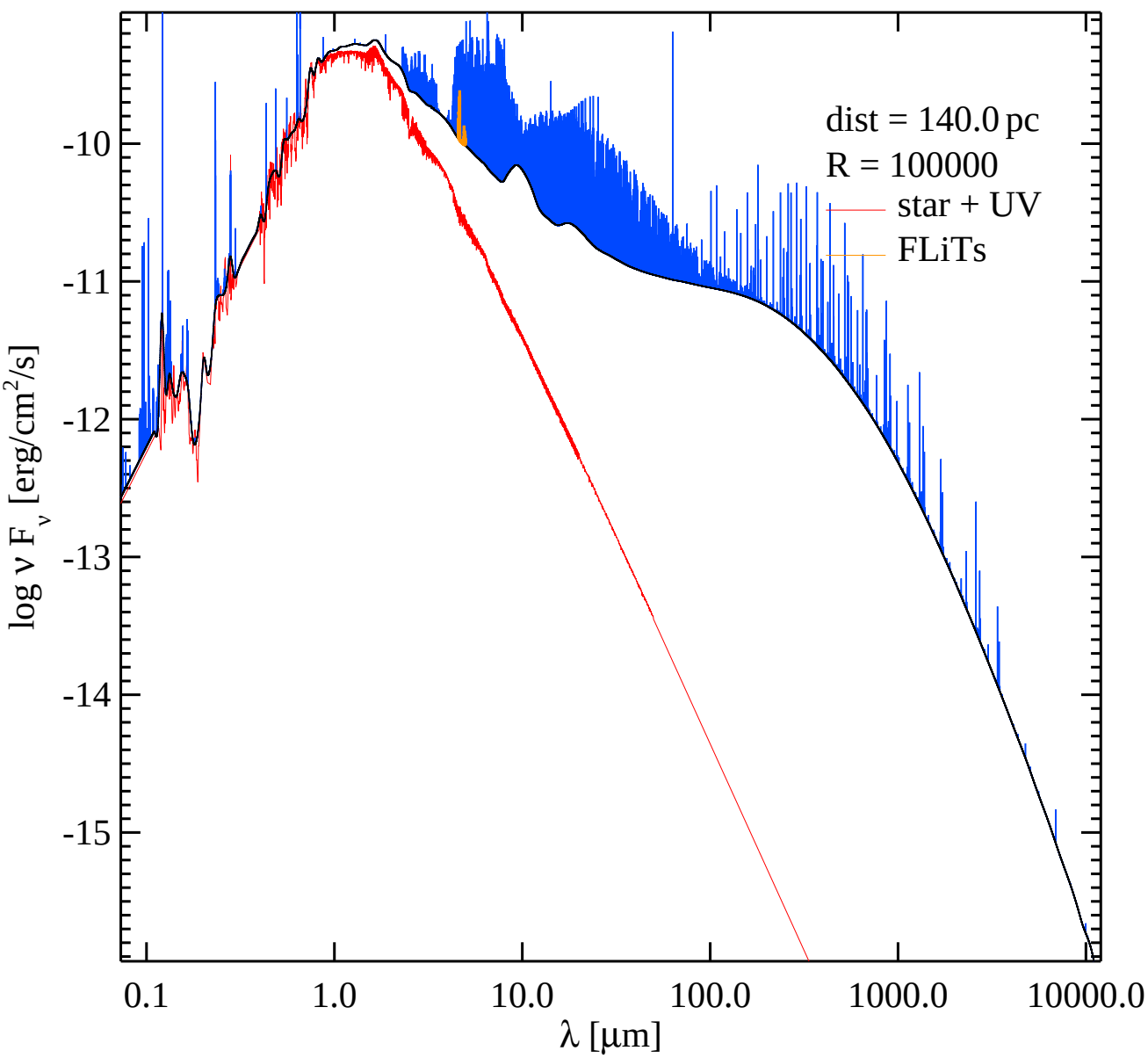

1000.000
100.000
10.000
1.000
0.100
0.010
0.001
κ [cm²/g(dust)]
0.1
1.0
10.0
100.0
1000.0
λ [μm]
κsca
κabs
λ-1
neutral PAH
charged PAH
(g/d= 100.0 fPAH= 0.01)
ProDiMo

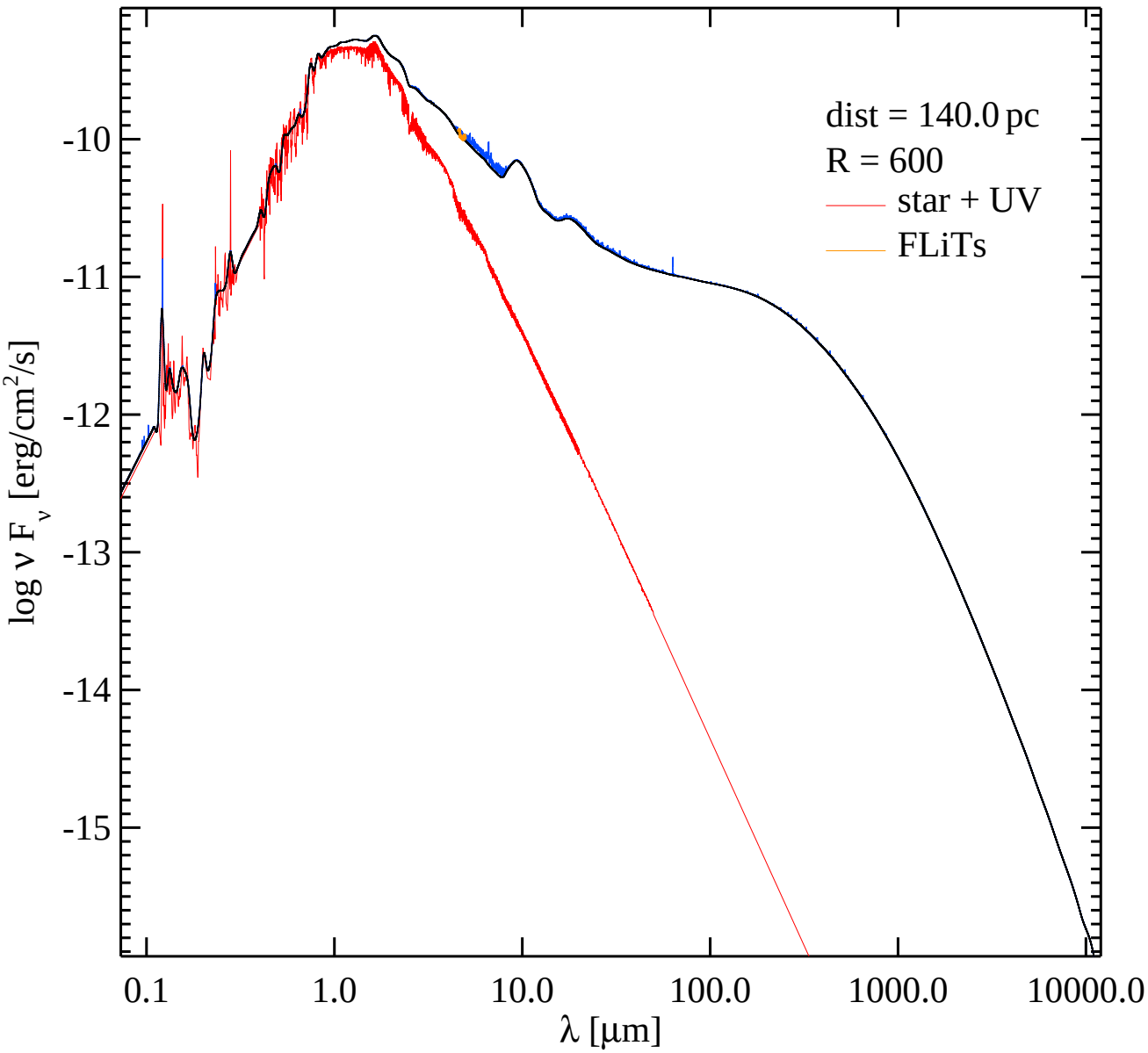

-10
-12
-14
-16
log ν F_ν [erg/cm²/s]
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]
dist = 140.0 pc, incl = 30°
star + UV
disk model
Spitzer IRS
<UV>data

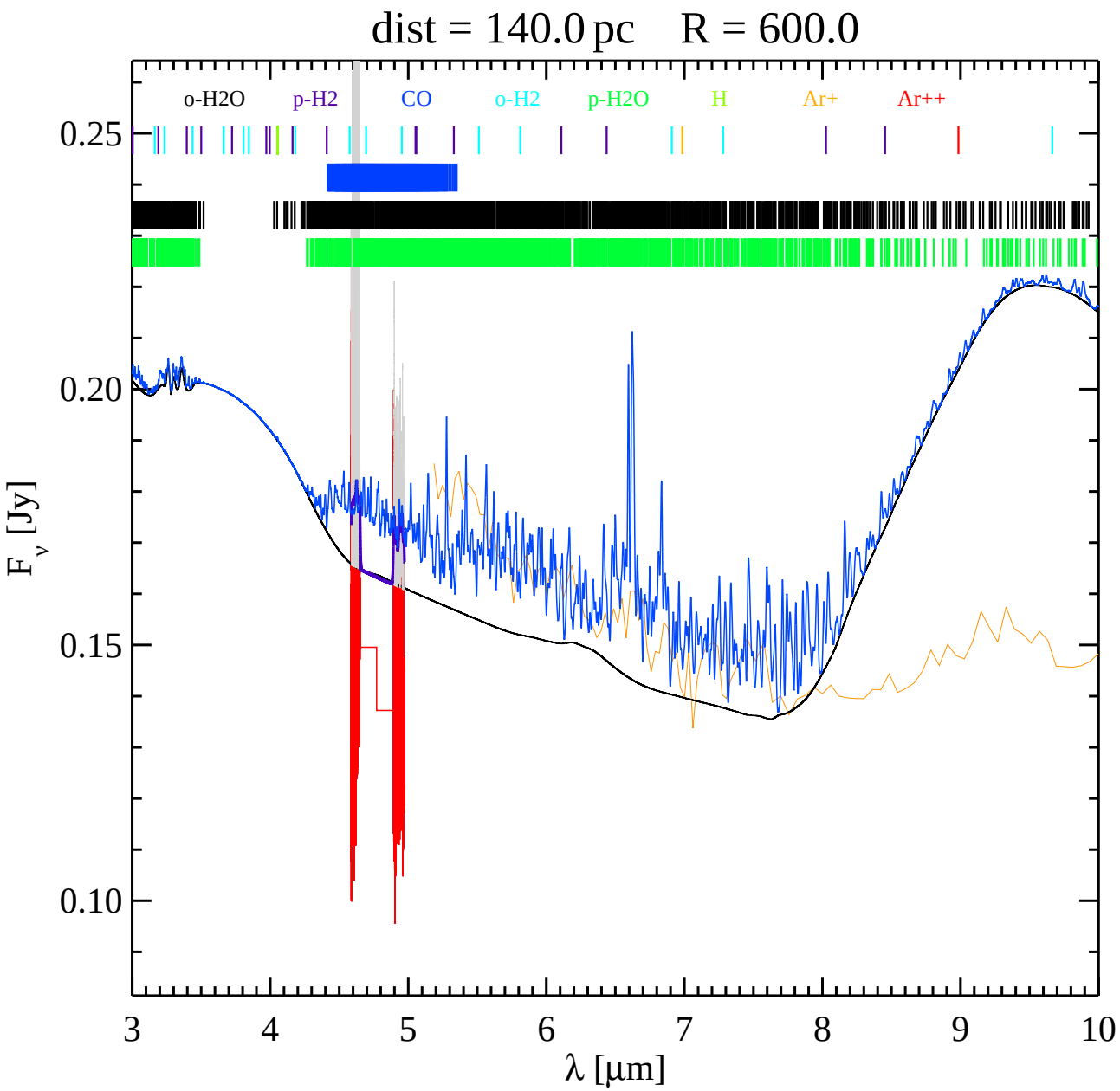

dist = 140.0 pc, incl = 30°
disk model
Spitzer IRS
0.25
0.20
0.15
0.10
F_ν [Jy]
4
6
8
10
12
14
λ [μm]

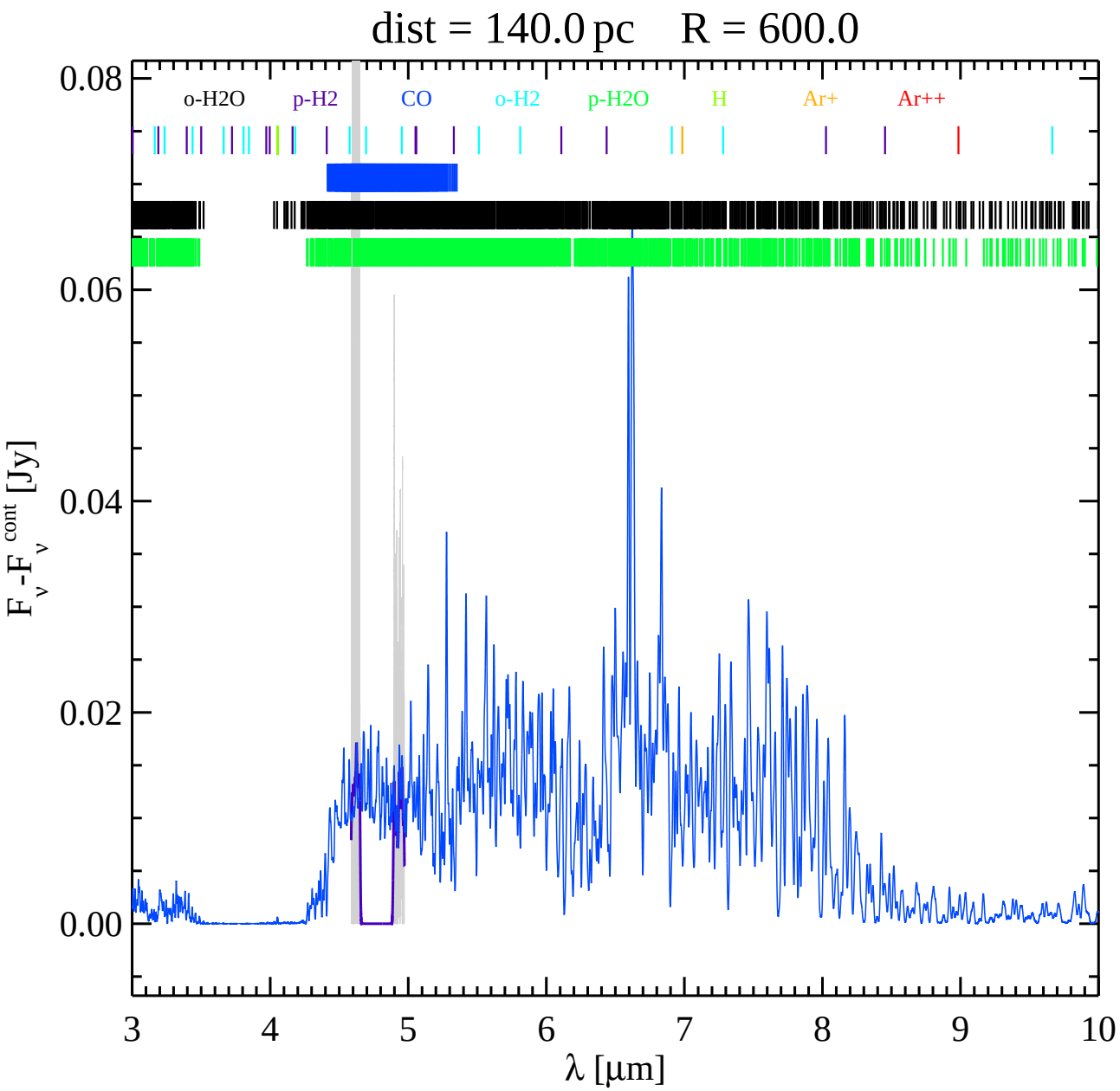

100.0
10.0
1.0
0.1
r [AU]
85%
15%
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

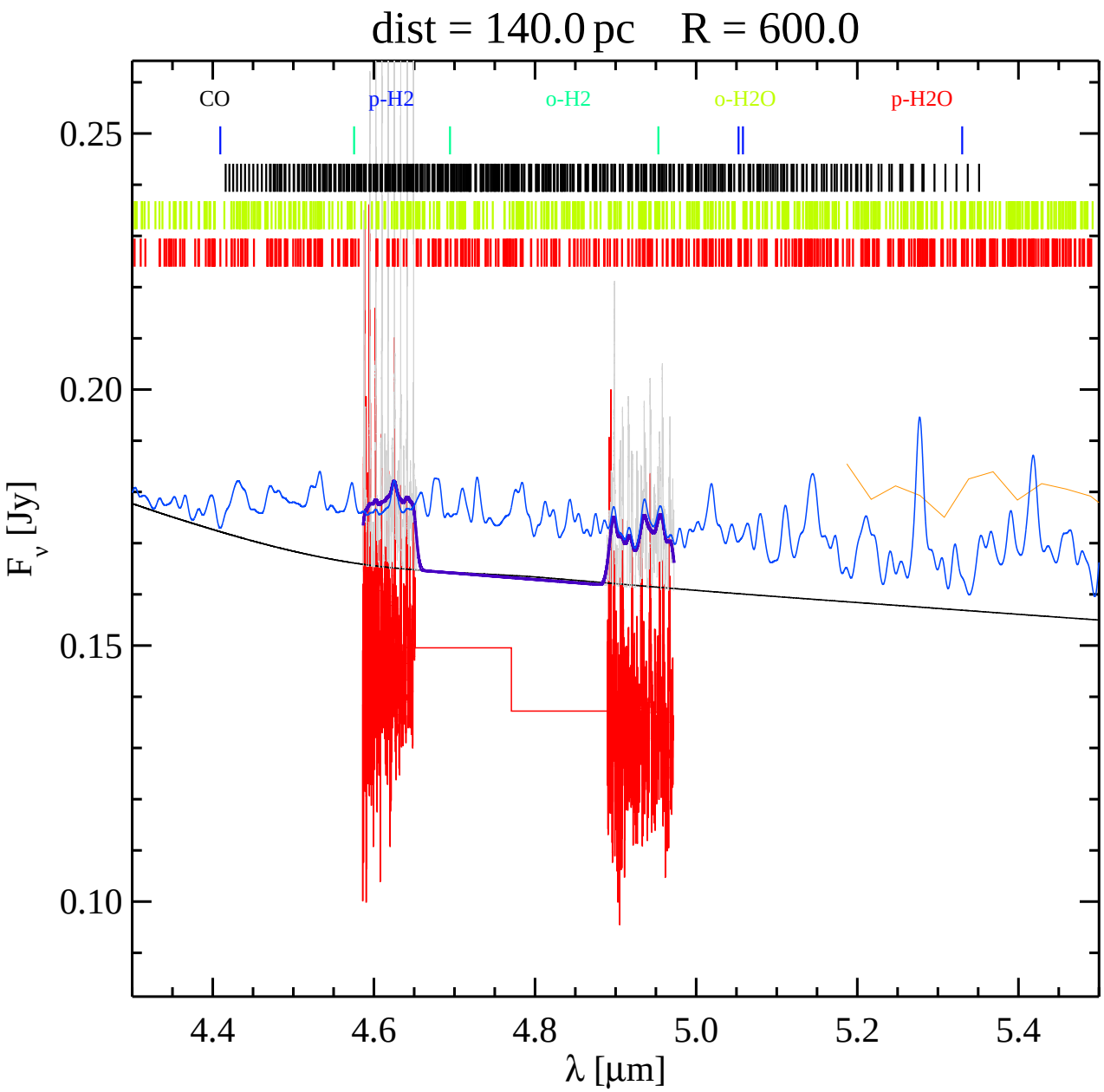

0.4
0.2
0.0
-0.2
-0.4
z/r
0.1
1.0
10.0
100.0
r [AU]
1µm
3µm
10µm
6µm
30µm
60µm
100µm
200µm
1000µm
AV=1
AV=10
AV=10
AV=1
4
6
8
10
12
log n<H> [cm-3]

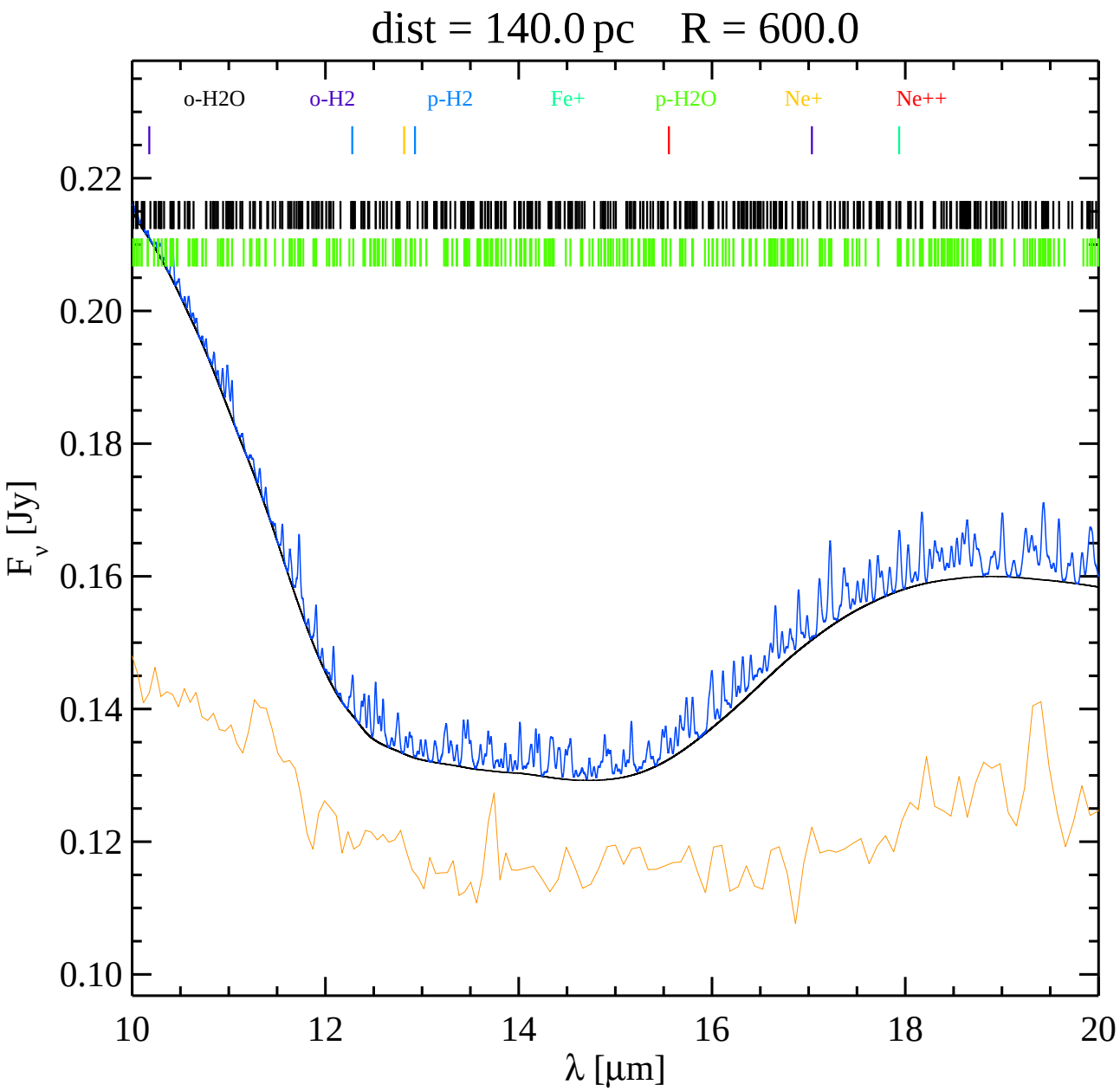

dist = 140.0 pc
R = 100000
star + UV
FLiTs
-10
-11
-12
-13
-14
-15
log ν F_ν [erg/cm²/s]
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

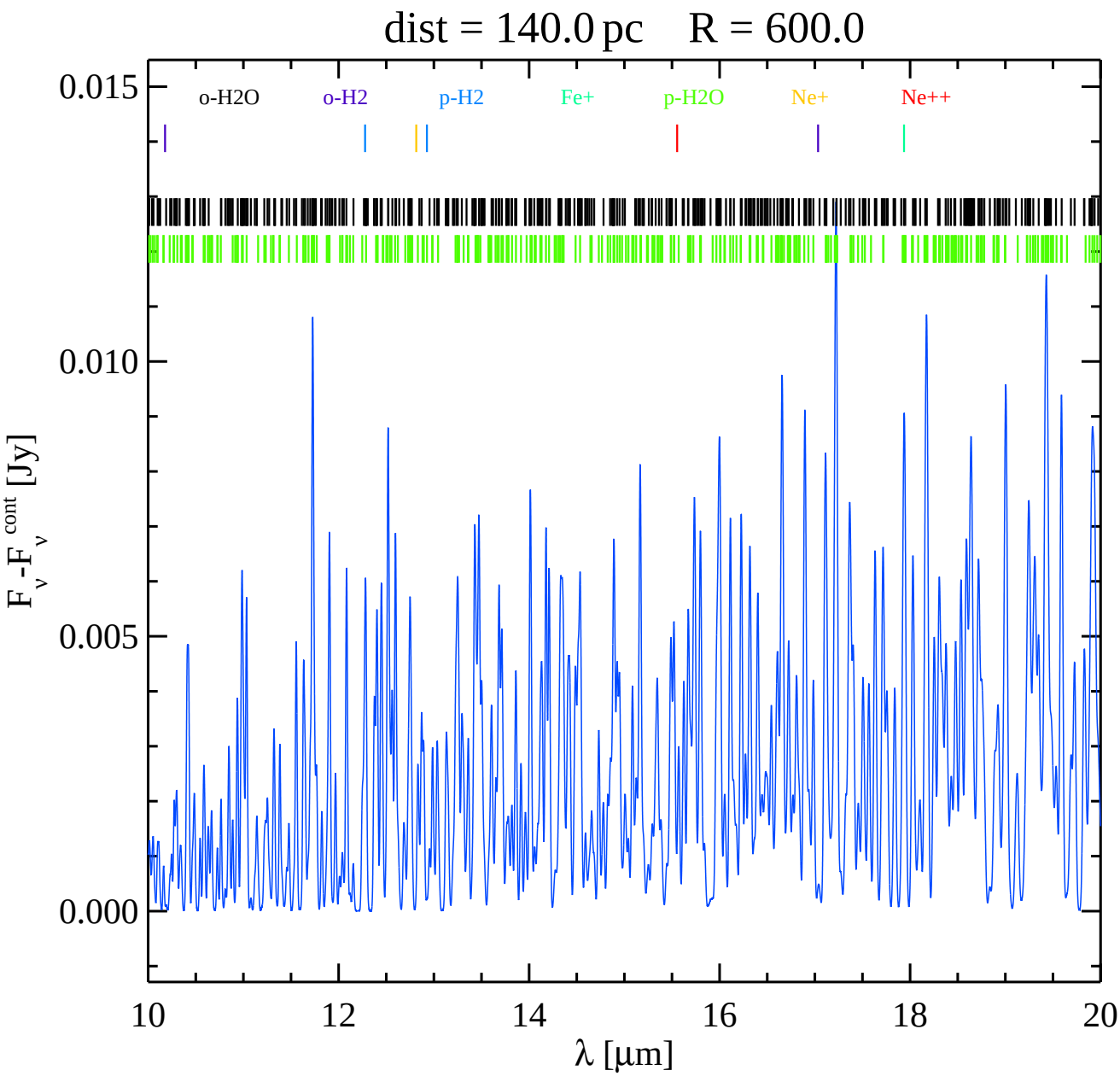

dist = 140.0 pc
R = 600
star + UV
FLiTs
-10
-11
-12
-13
-14
-15
log ν F_ν [erg/cm²/s]
0.1
1.0
10.0
100.0
1000.0
10000.0
λ [μm]

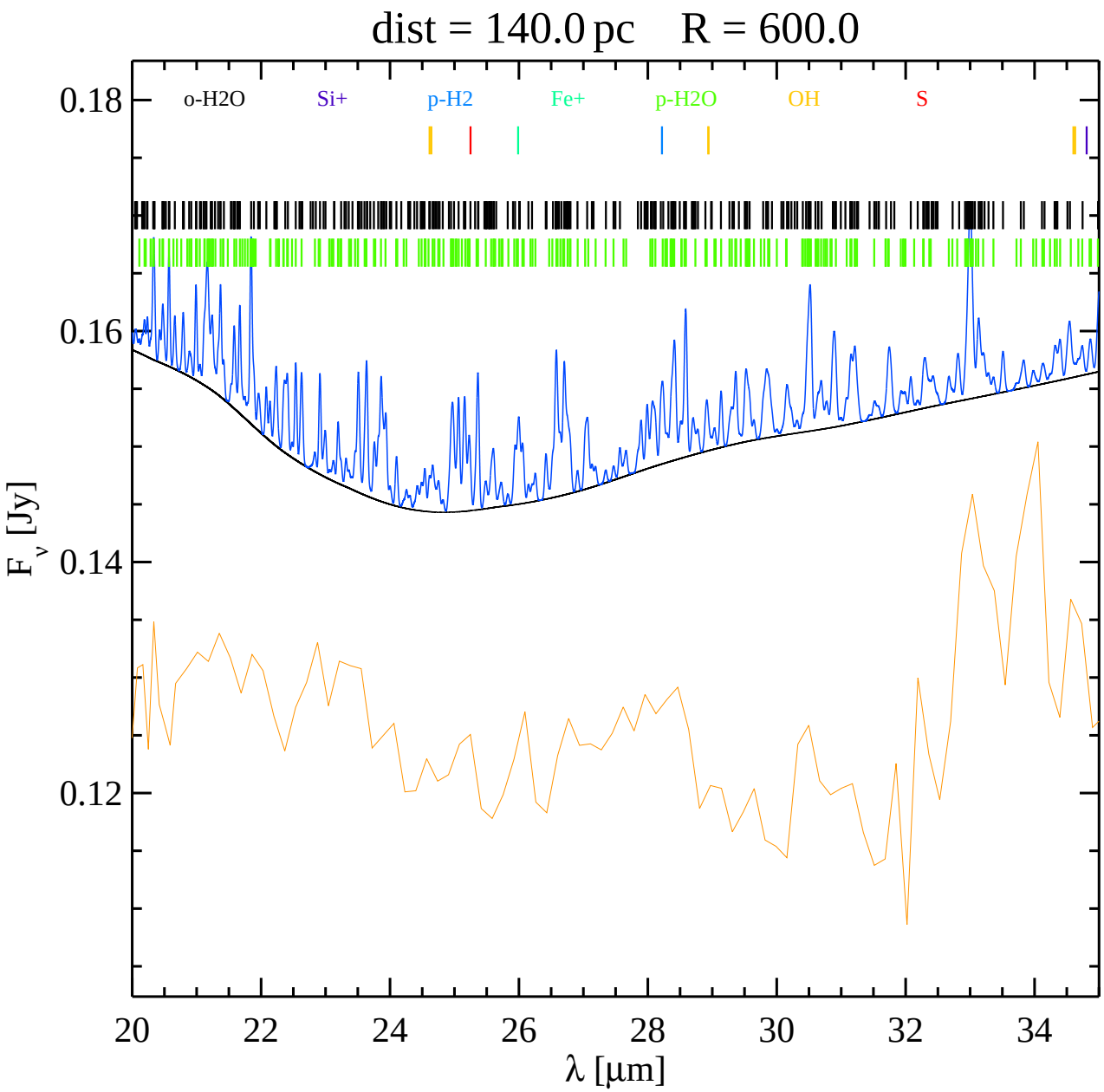

dist = 140.0 pc R = 600.0
o-H2O
p-H2
CO
o-H2
p-H2O
H
Ar+
Ar++
0.25
0.20
0.15
0.10
F_ν [Jy]
3
4
5
6
7
8
9
10
λ [μm]

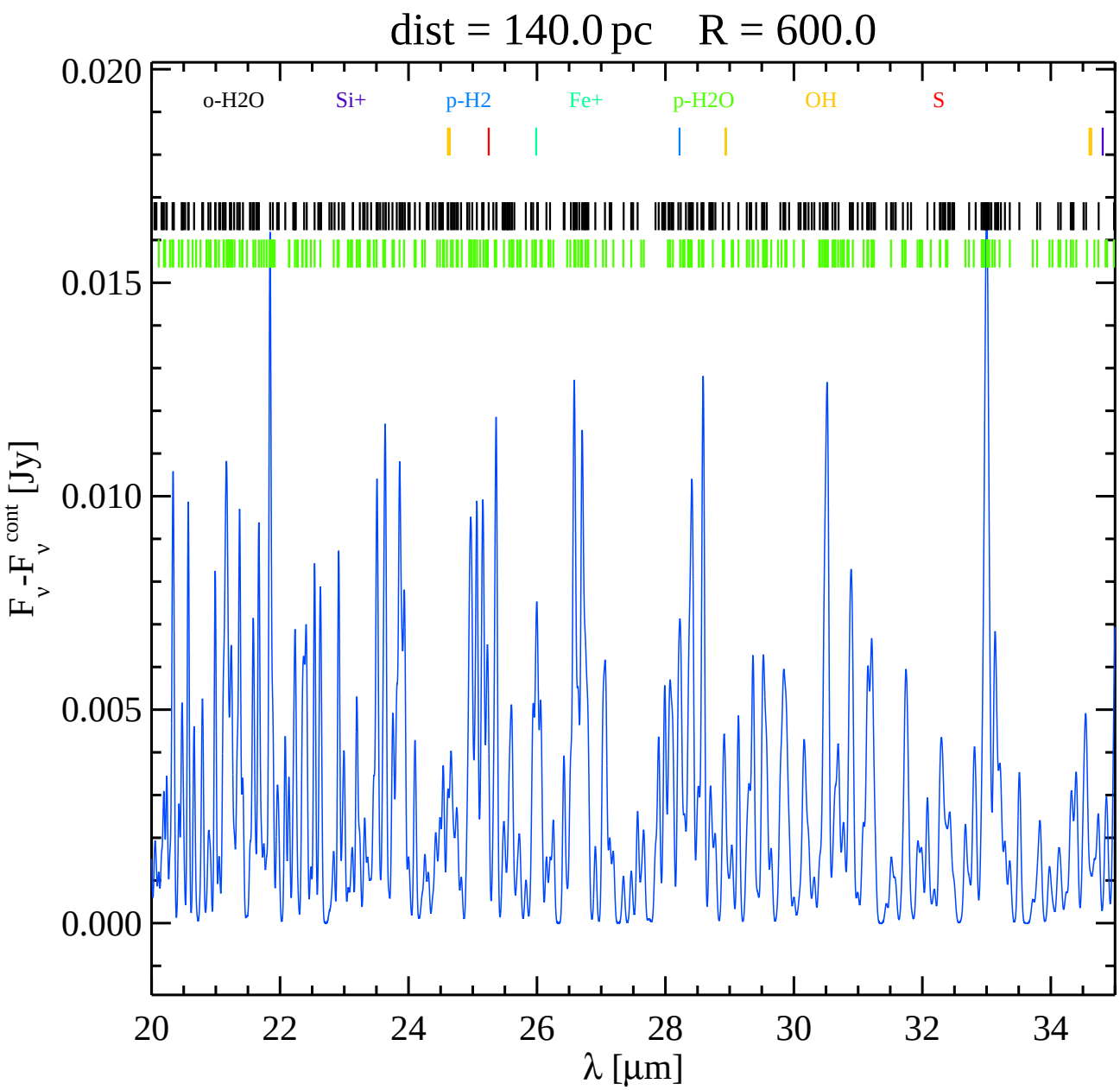

dist = 140.0 pc R = 600.0
o-H2O
p-H2
CO
o-H2
p-H2O
H
Ar+
Ar++
0.08
0.06
0.04
0.02
0.00
F_ν -F_ν^cont [Jy]
3
4
5
6
7
8
9
10
λ [μm]

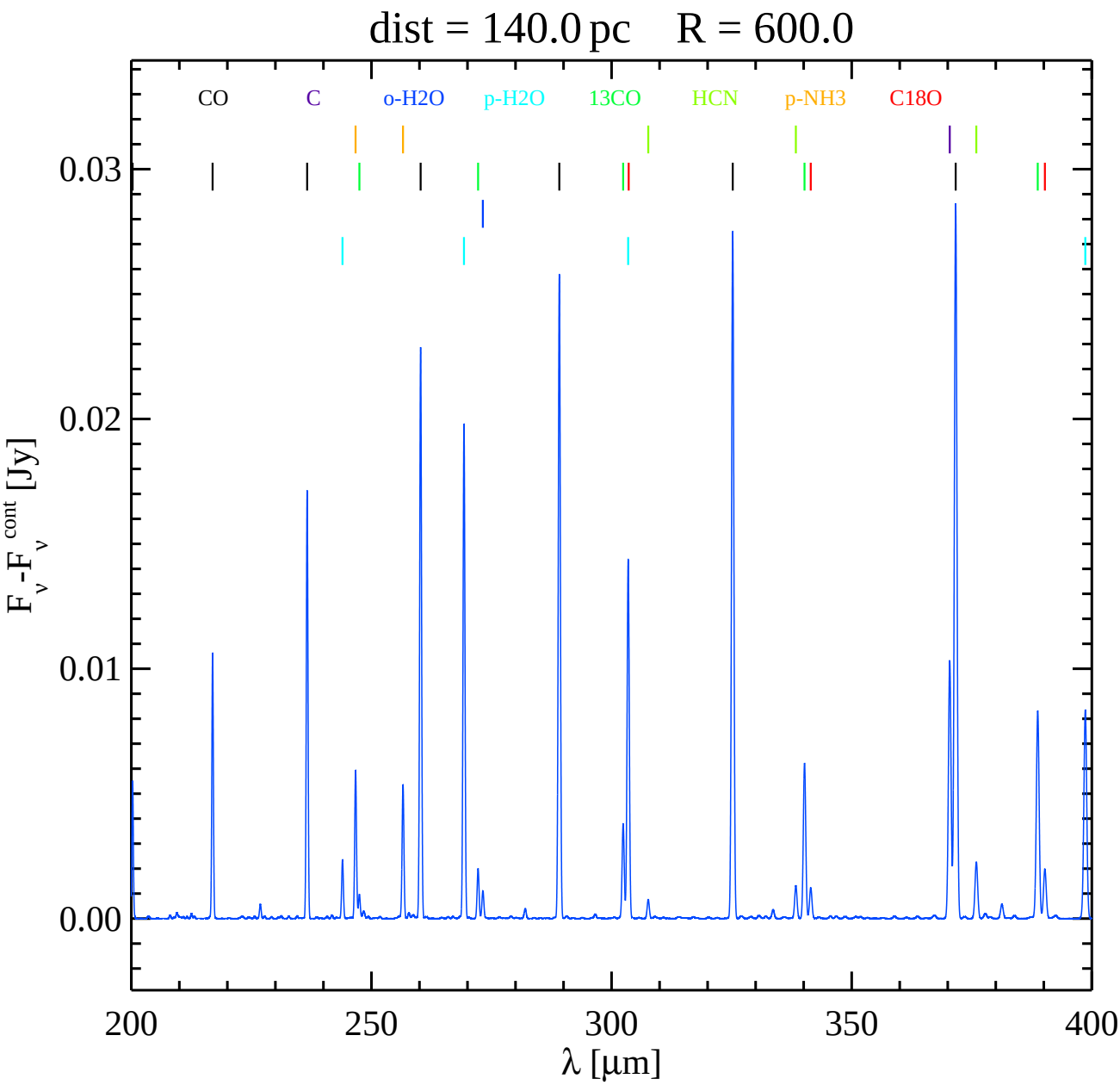

dist = 140.0 pc R = 600.0
CO
p-H2
o-H2
o-H2O
p-H2O
0.25
0.20
0.15
0.10
F_ν [Jy]
4.4
4.6
4.8
5.0
5.2
5.4
λ [μm]

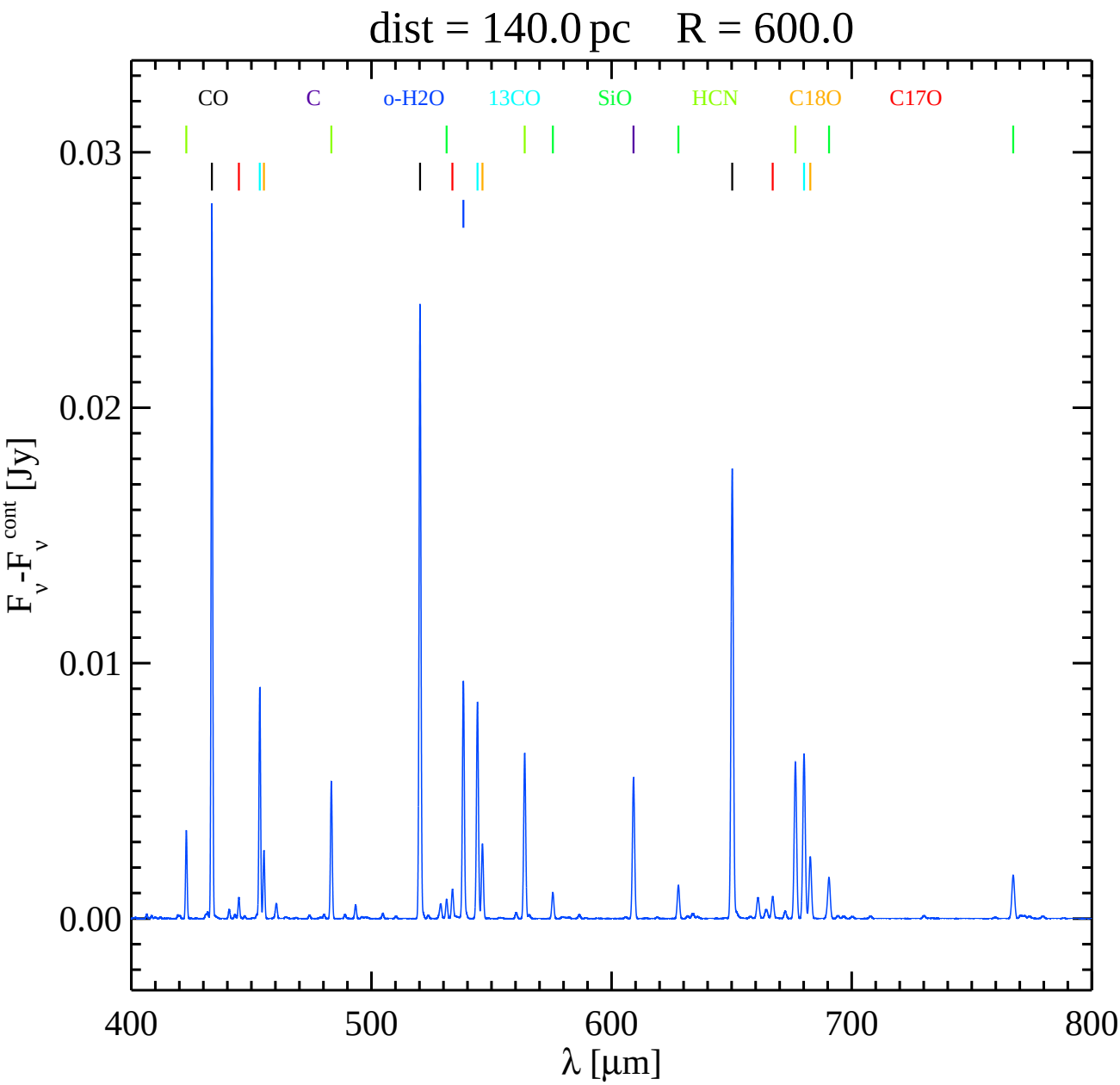

dist = 140.0 pc R = 600.0
o-H2O
o-H2
p-H2
Fe+
p-H2O
Ne+
Ne++
0.22
0.20
0.18
0.16
0.14
0.12
0.10
F_ν [Jy]
10
12
14
16
18
20
λ [μm]

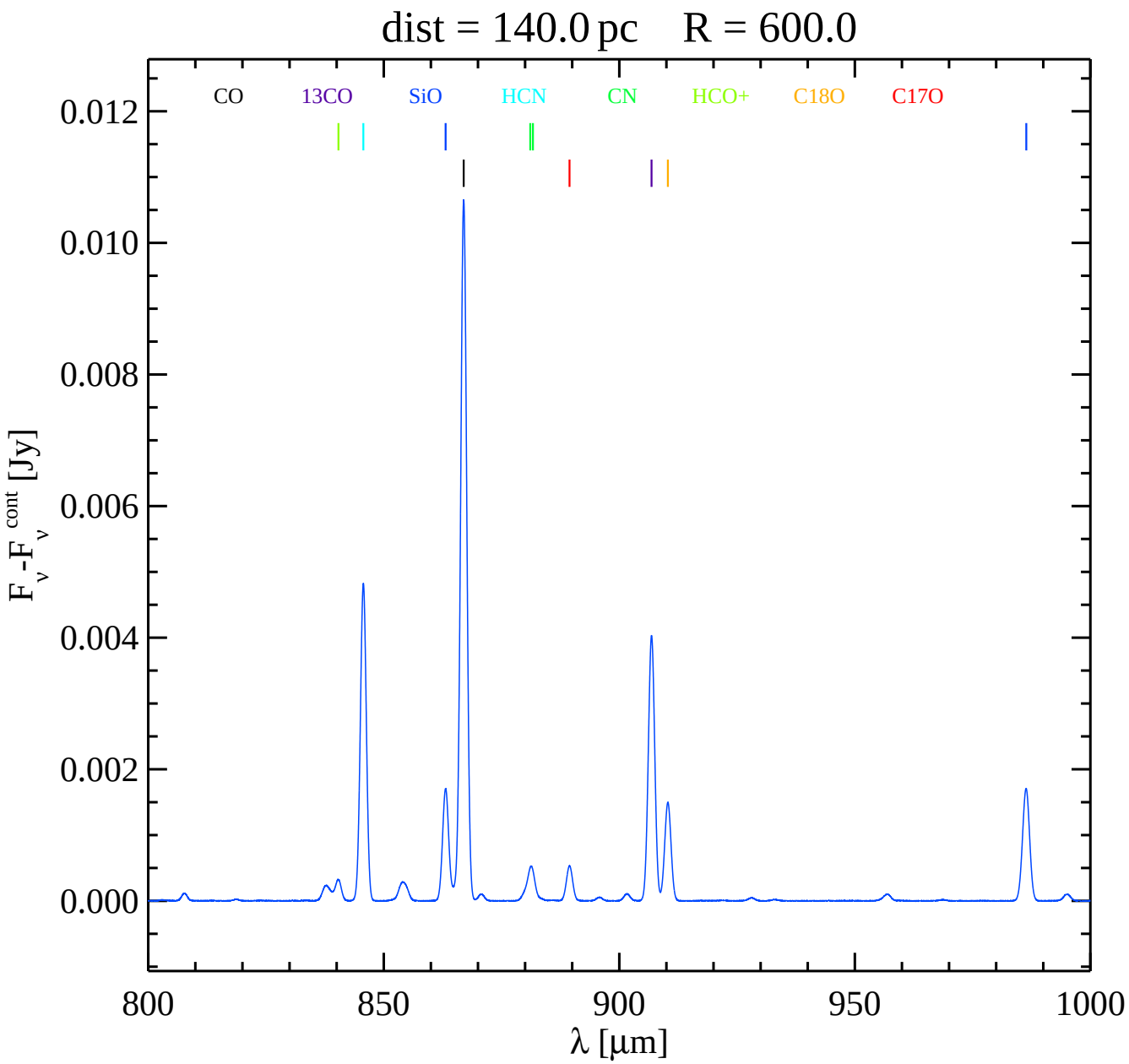

dist = 140.0 pc R = 600.0
o-H2O
o-H2
p-H2
Fe+
p-H2O
Ne+
Ne++
0.015
0.010
0.005
0.000
F_ν -F_ν^cont [Jy]
10
12
14
16
18
20
λ [μm]

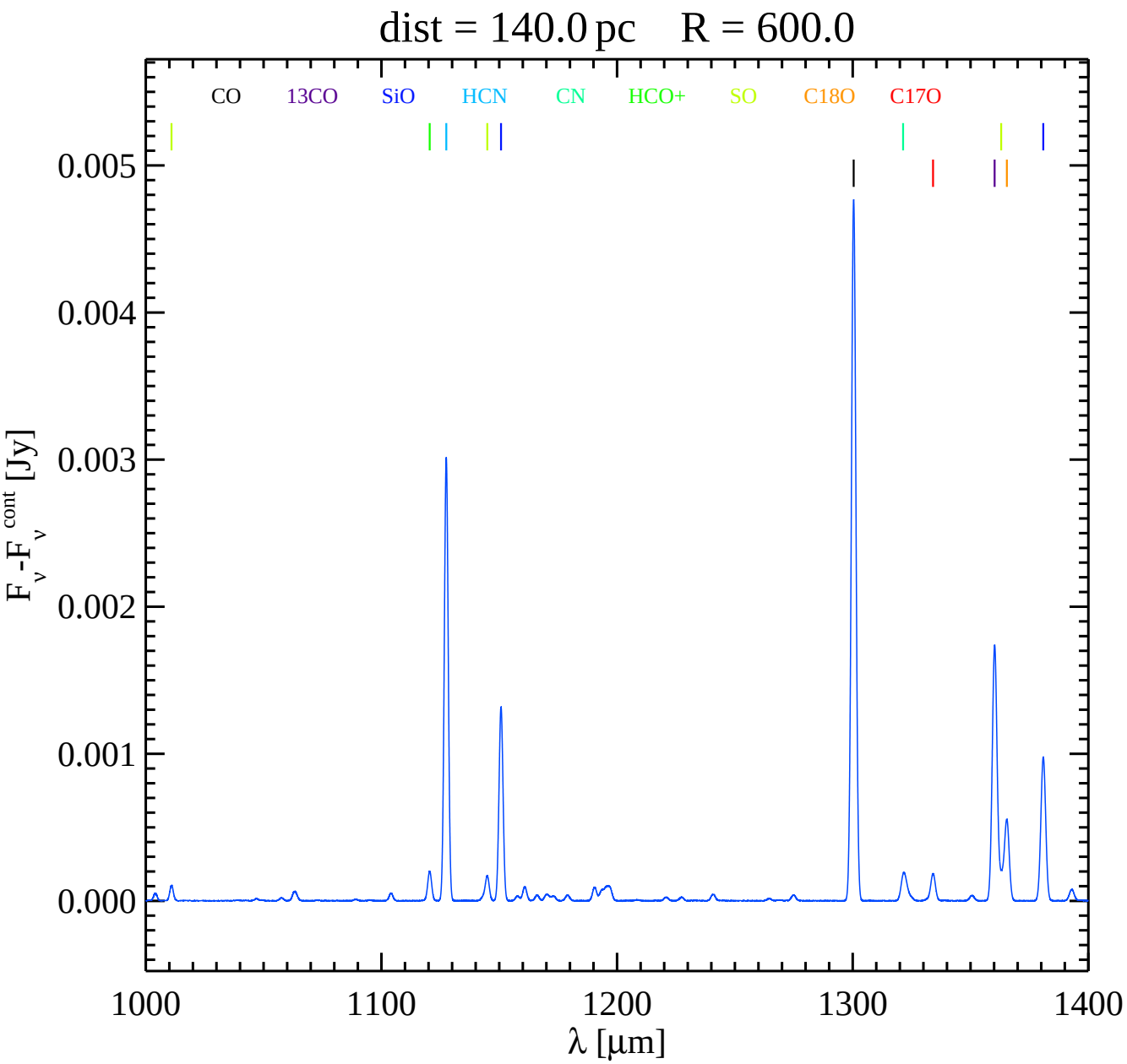

dist = 140.0 pc R = 600.0
o-H2O
Si+
p-H2
Fe+
p-H2O
OH
S
0.18
0.16
0.14
0.12
F_ν [Jy]
20
22
24
26
28
30
32
34
λ [μm]

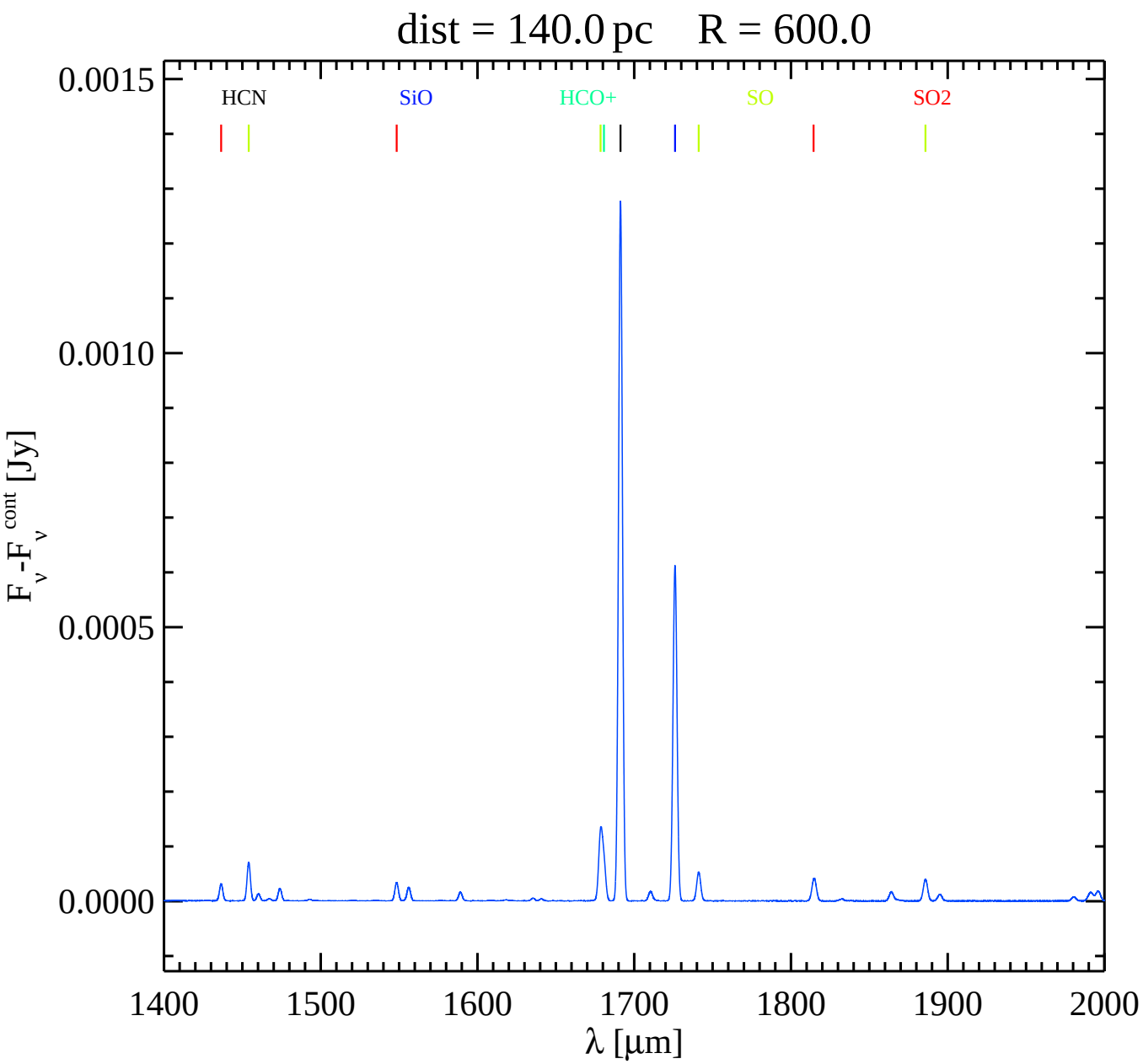

dist = 140.0 pc R = 600.0
o-H2O
Si+
p-H2
Fe+
p-H2O
OH
S
0.020
0.015
0.010
0.005
0.000
F_ν -F_ν^cont [Jy]
20
22
24
26
28
30
32
34
λ [μm]

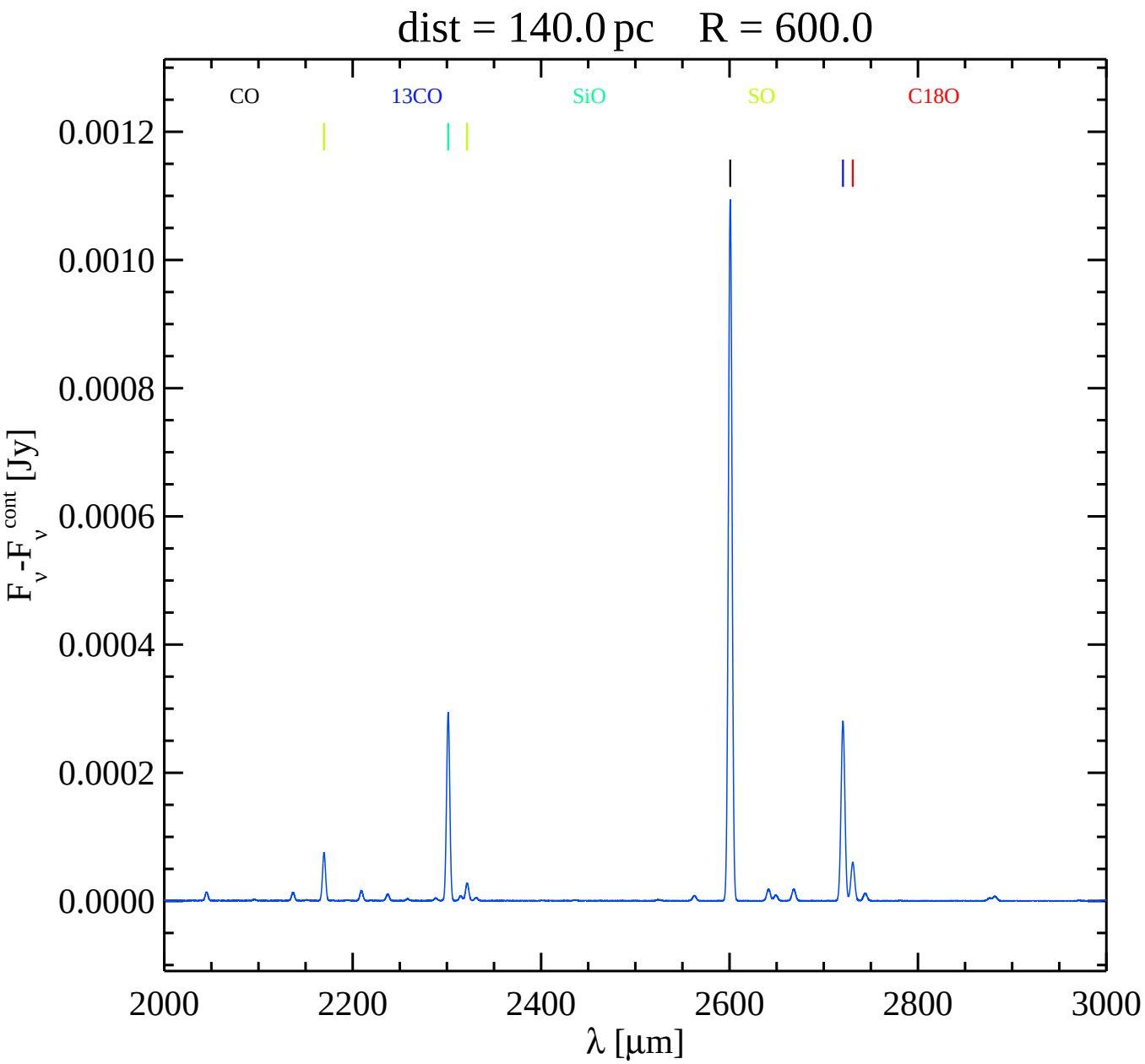

dist = 140.0 pc R = 600.0
CO
C
o-H2O
p-H2O
13CO
HCN
p-NH3
C18O
0.03
0.02
0.01
0.00
F_ν -F_ν^cont [Jy]
200
250
300
350
400
λ [μm]

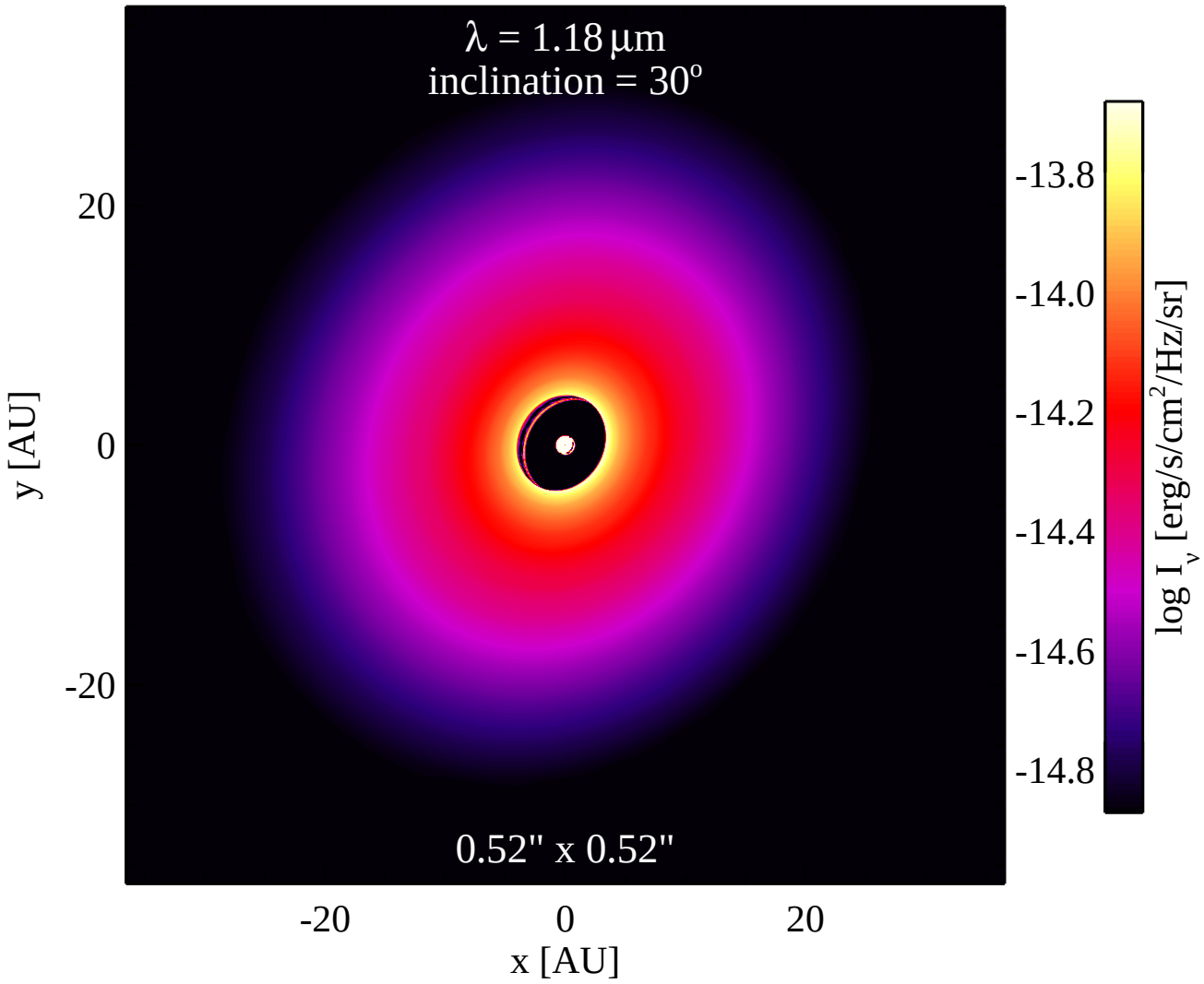

dist = 140.0 pc R = 600.0
CO
C
o-H2O
13CO
SiO
HCN
C18O
C17O
0.03
0.02
0.01
0.00
F_ν -F_ν^cont [Jy]
400
500
600
700
800
λ [μm]

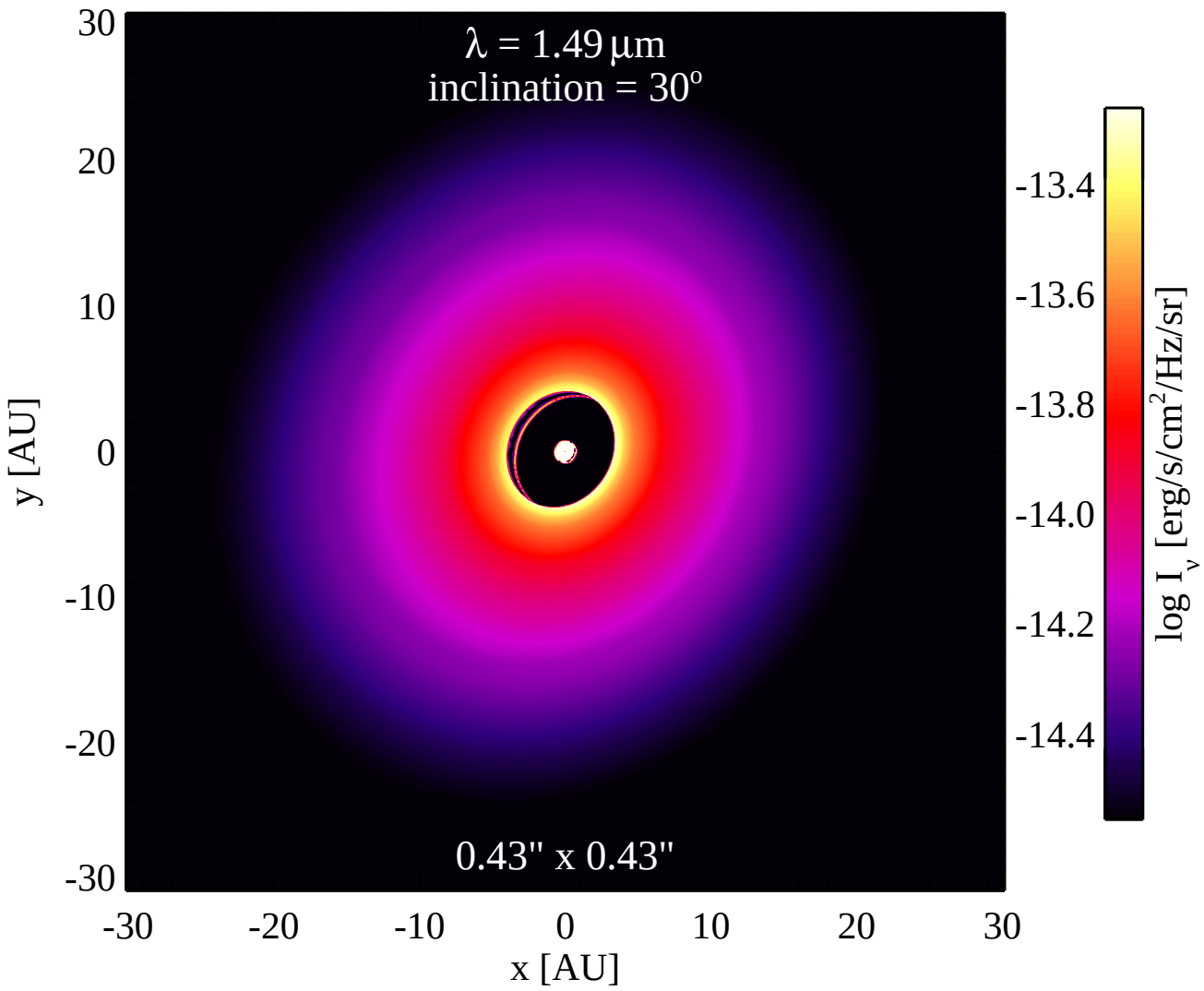

dist = 140.0 pc R = 600.0
CO
13CO
SiO
HCN
CN
HCO+
C18O
C17O
0.012
0.010
0.008
0.006
0.004
0.002
0.000
F_ν -F_ν^cont [Jy]
800
850
900
950
1000
λ [μm]

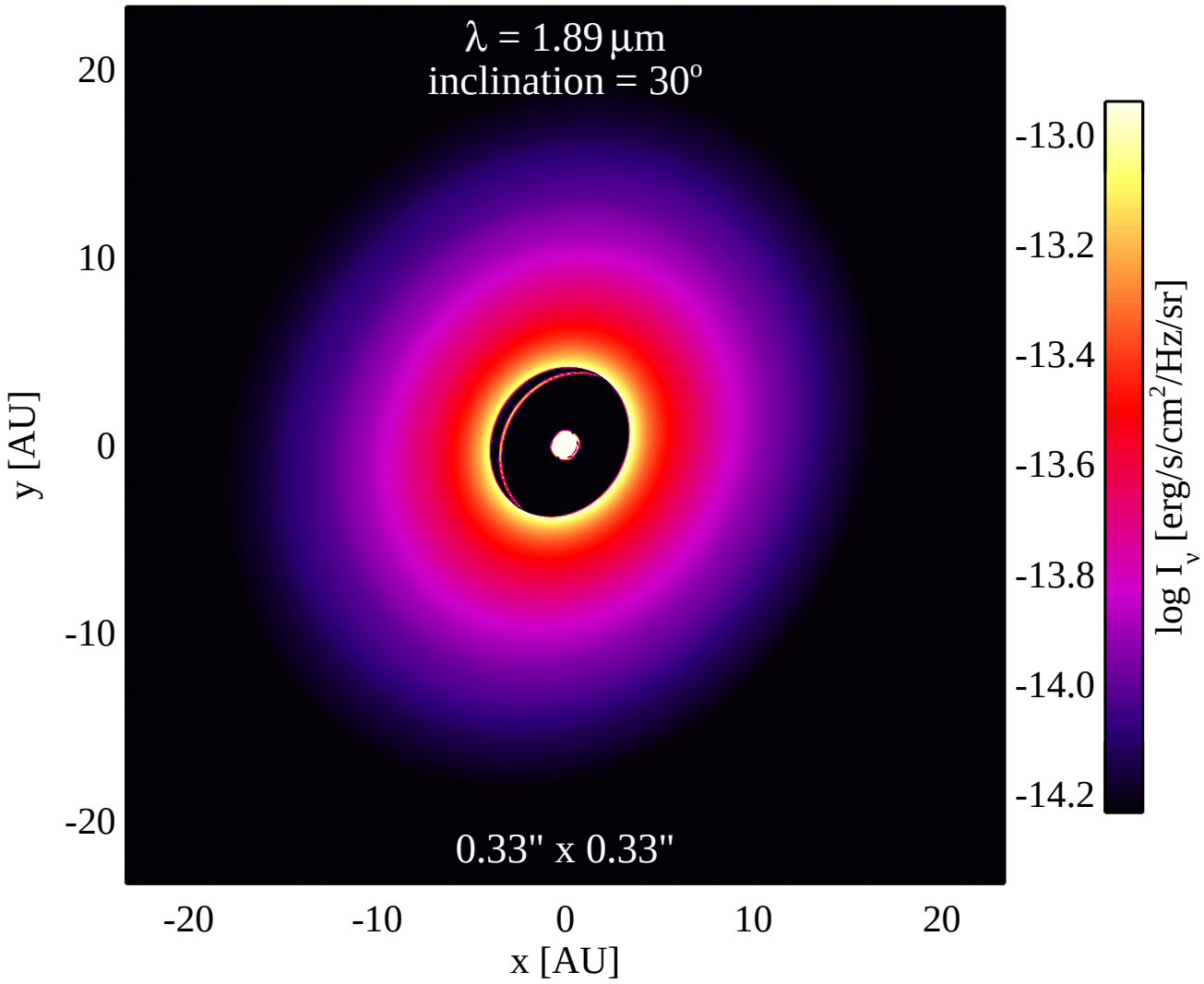

dist = 140.0 pc R = 600.0
CO
13CO
SiO
HCN
CN
HCO+
SO
C18O
C17O
0.005
0.004
0.003
0.002
0.001
0.000
F_ν -F_ν^cont [Jy]
1000
1100
1200
1300
1400
λ [μm]

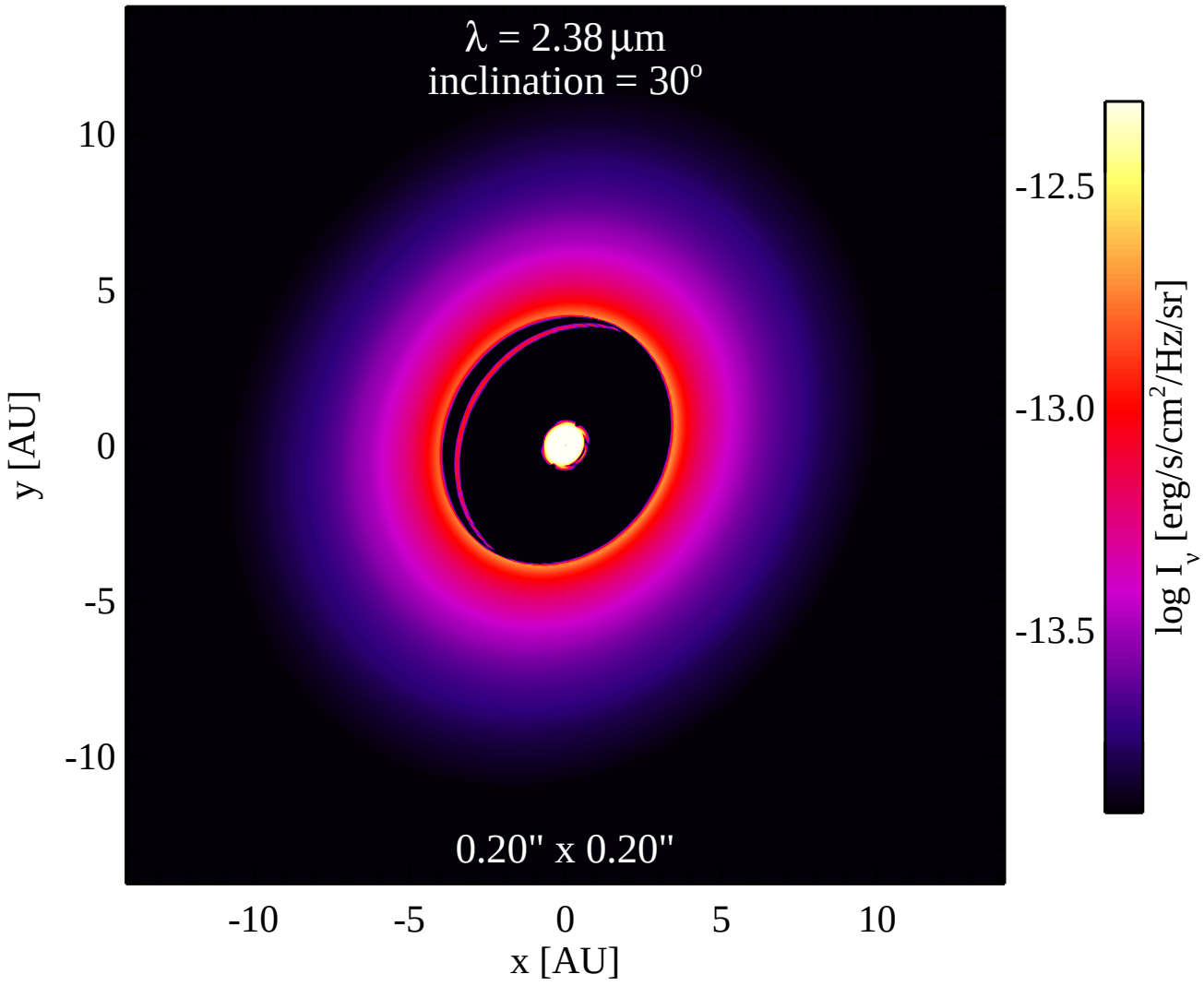

dist = 140.0 pc R = 600.0
HCN
SiO
HCO+
SO
SO2
0.0015
0.0010
0.0005
0.0000
F_ν -F_ν^cont [Jy]
1400
1500
1600
1700
1800
1900
2000
λ [μm]

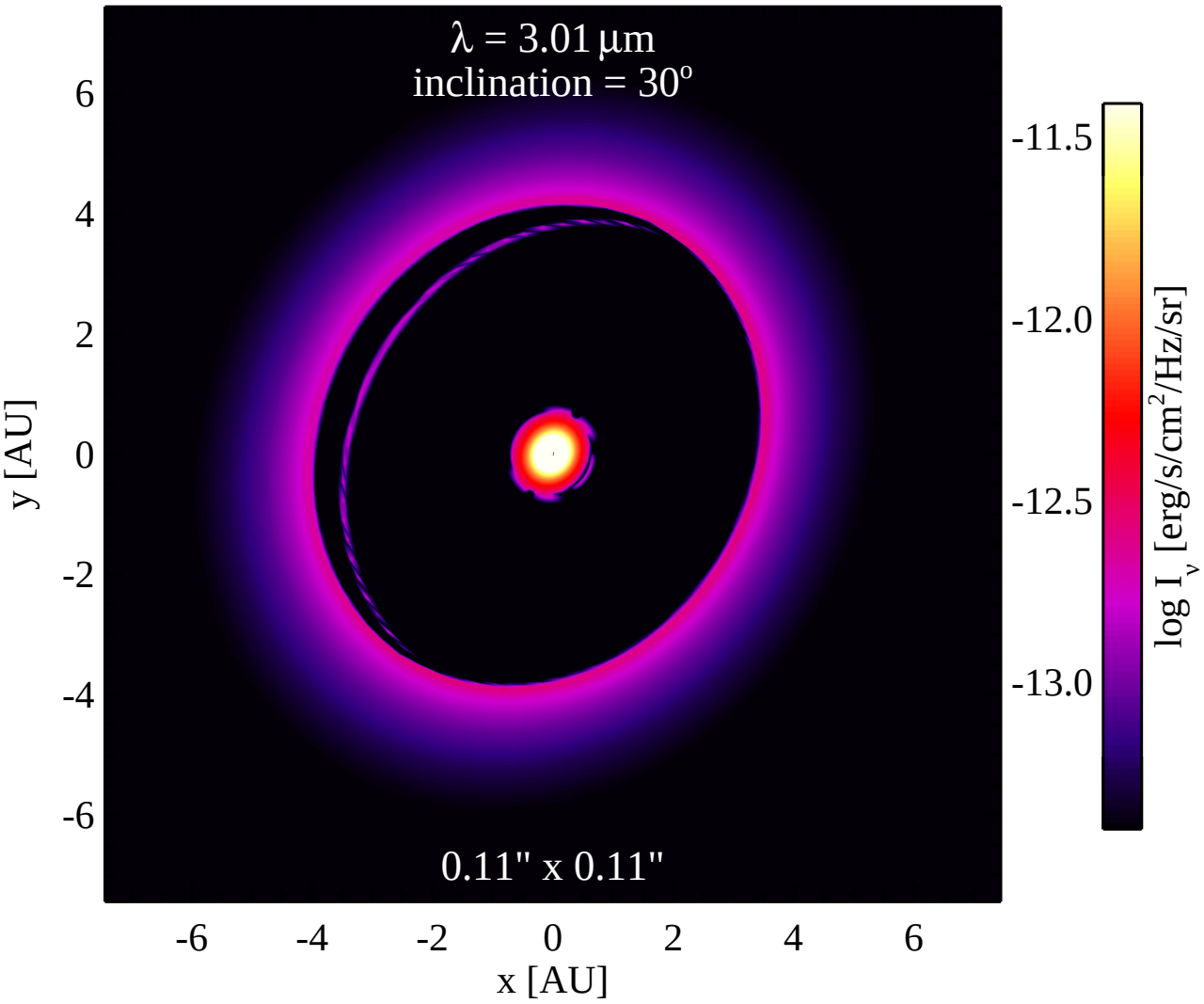

dist = 140.0 pc R = 600.0
CO
13CO
SiO
SO
C18O
0.0012
0.0010
0.0008
0.0006
0.0004
0.0002
0.0000
F_ν -F_ν^cont [Jy]
2000
2200
2400
2600
2800
3000
λ [μm]

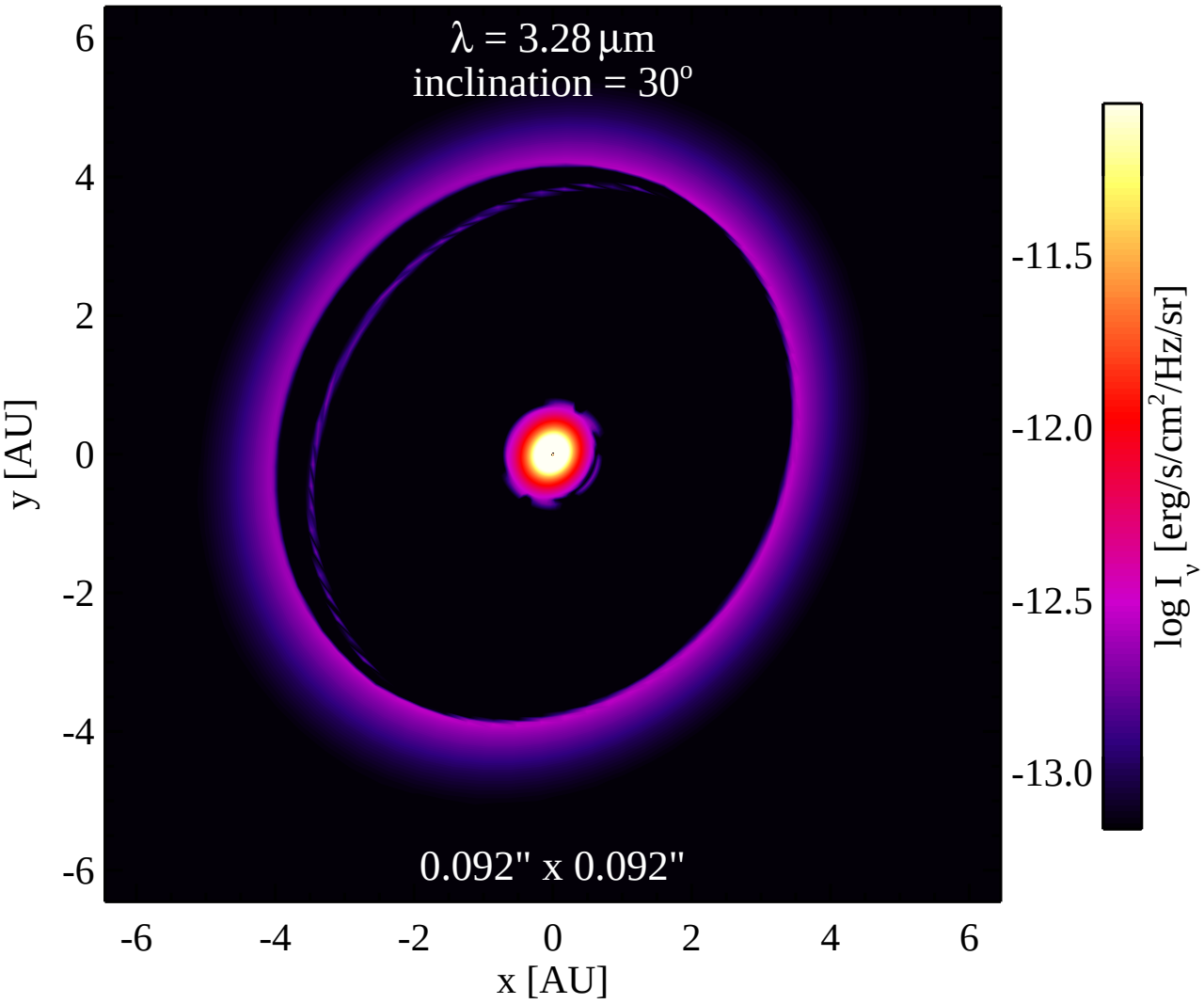

λ = 1.18 μm
inclination = 30°
0.52" x 0.52"
20
0
-20
y [AU]
-20
0
20
x [AU]
-13.8
-14.0
-14.2
-14.4
-14.6
-14.8
log I_ν [erg/s/cm²/Hz/sr]

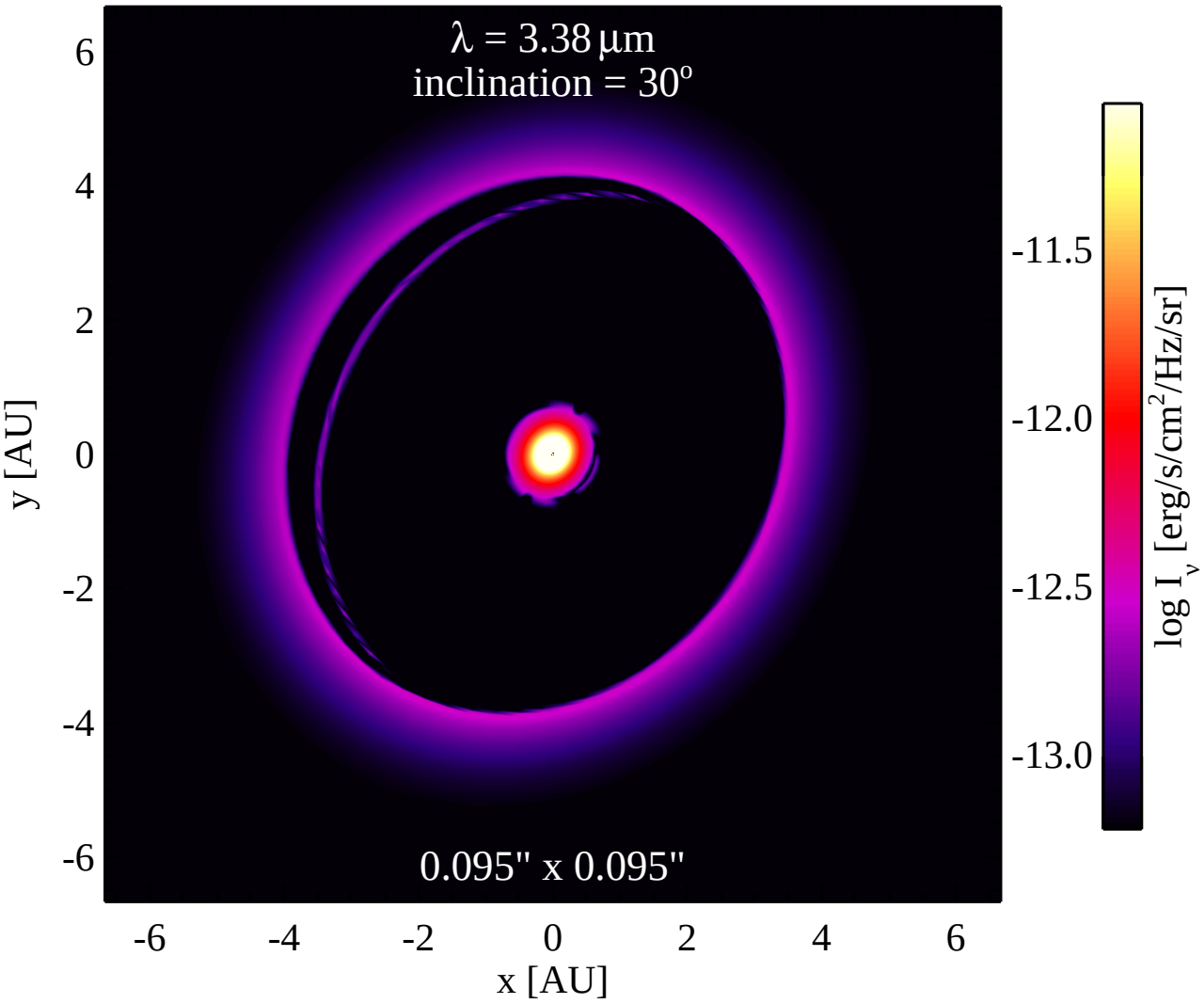

λ = 1.49 μm
inclination = 30°
0.43" x 0.43"
30
20
10
0
-10
-20
-30
y [AU]
-30
-20
-10
0
10
20
30
x [AU]
-13.4
-13.6
-13.8
-14.0
-14.2
-14.4
log I_ν [erg/s/cm²/Hz/sr]

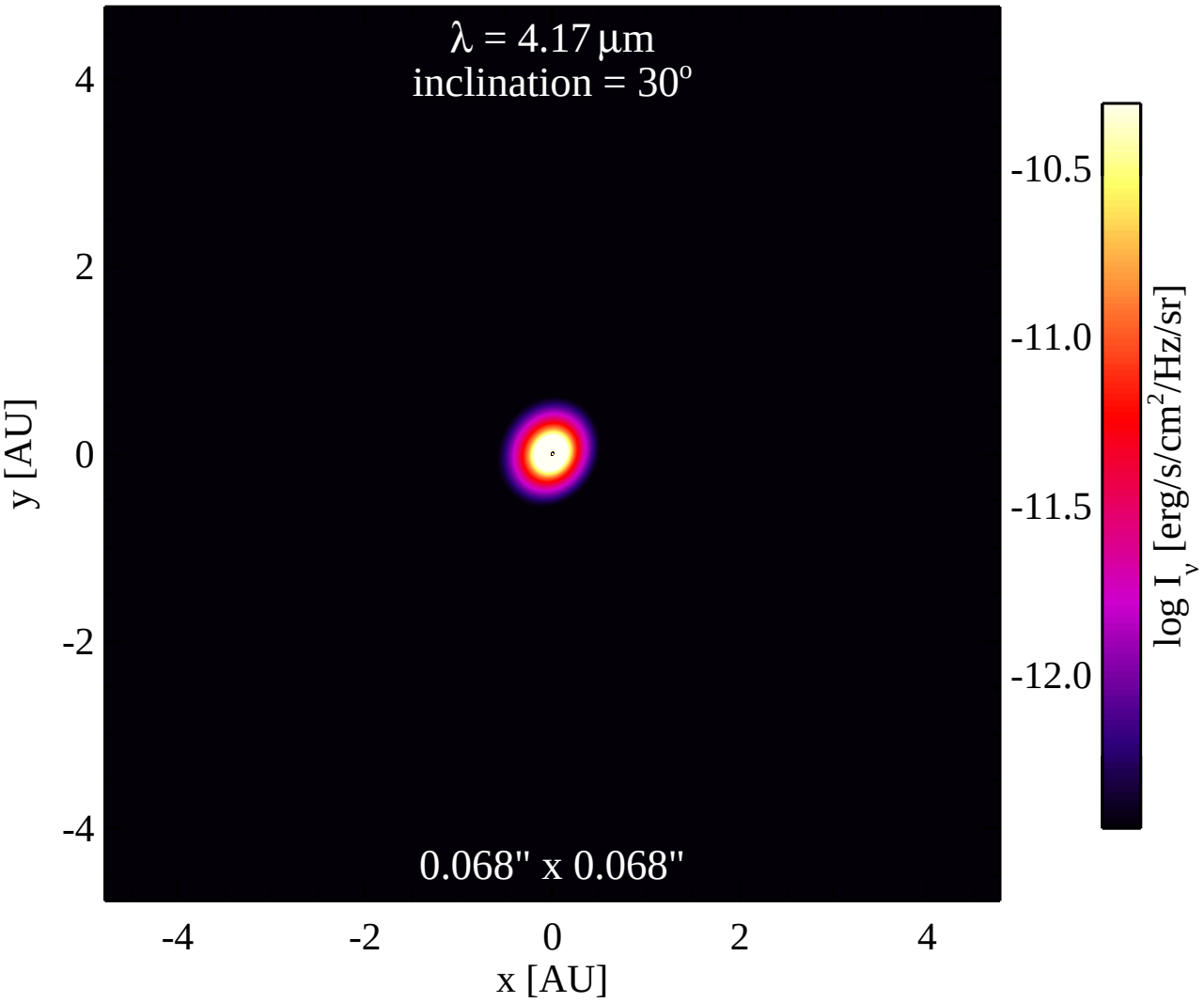

λ = 1.89 μm
inclination = 30°
0.33" x 0.33"
20
10
0
-10
-20
y [AU]
-20
-10
0
10
20
x [AU]
-13.0
-13.2
-13.4
-13.6
-13.8
-14.0
-14.2
log I_ν [erg/s/cm²/Hz/sr]

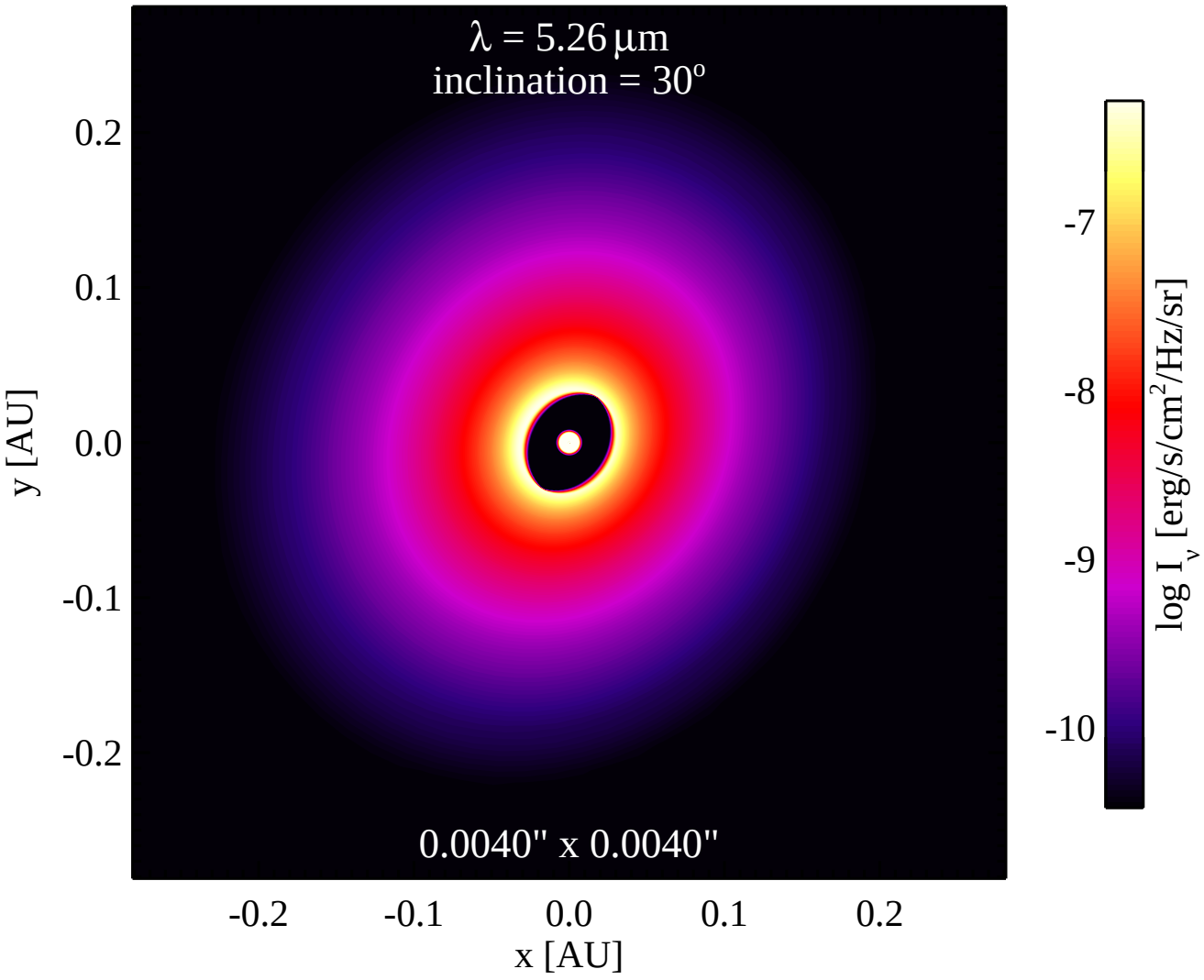

λ = 2.38 μm
inclination = 30°
0.20" x 0.20"
10
5
0
-5
-10
y [AU]
-10
-5
0
5
10
x [AU]
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

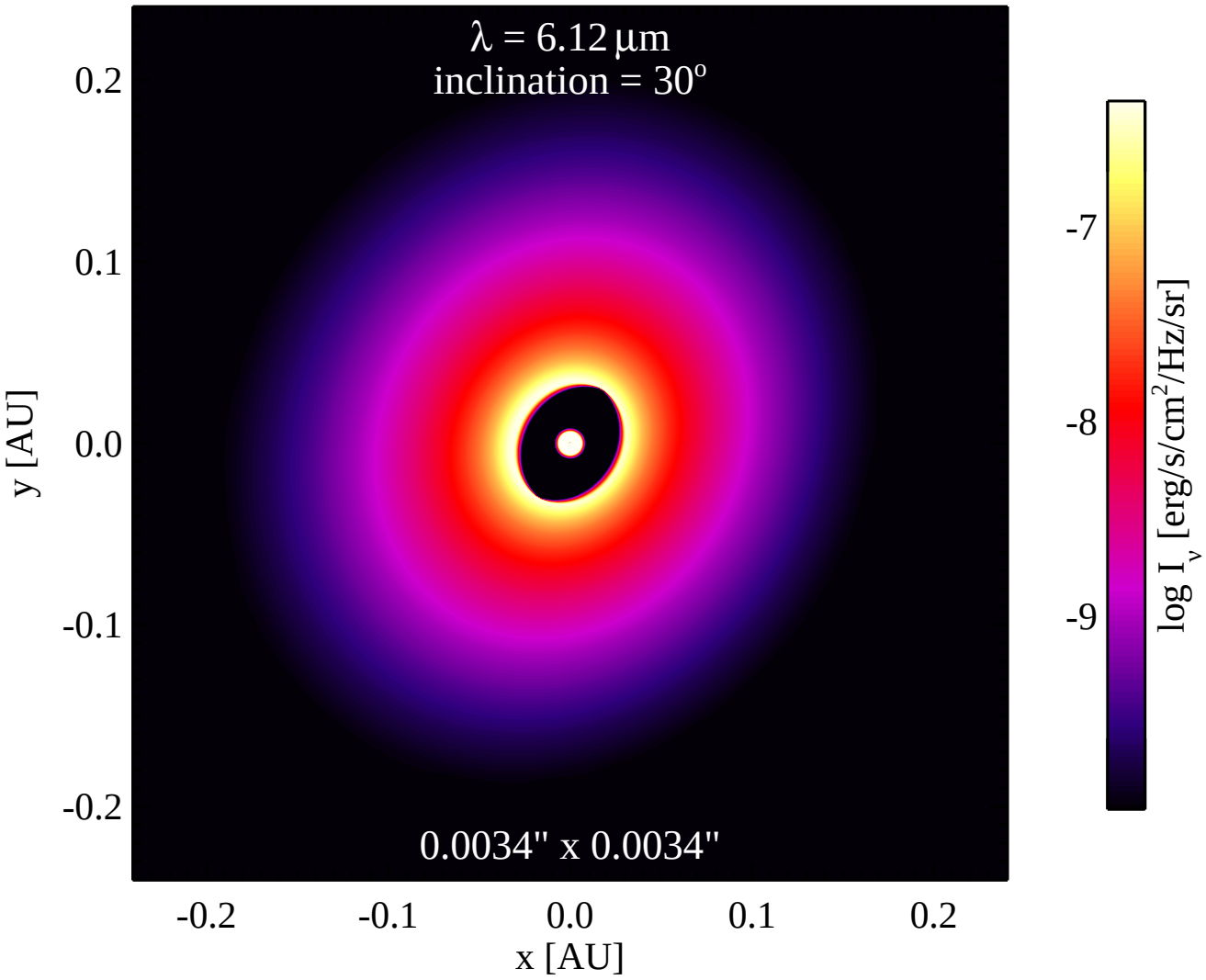

λ = 3.01 μm
inclination = 30°
0.11" x 0.11"
y [AU]
x [AU]
6
4
2
0
-2
-4
-6
-6
-4
-2
0
2
4
6
-11.5
-12.0
-12.5
-13.0
log I_ν [erg/s/cm²/Hz/sr]

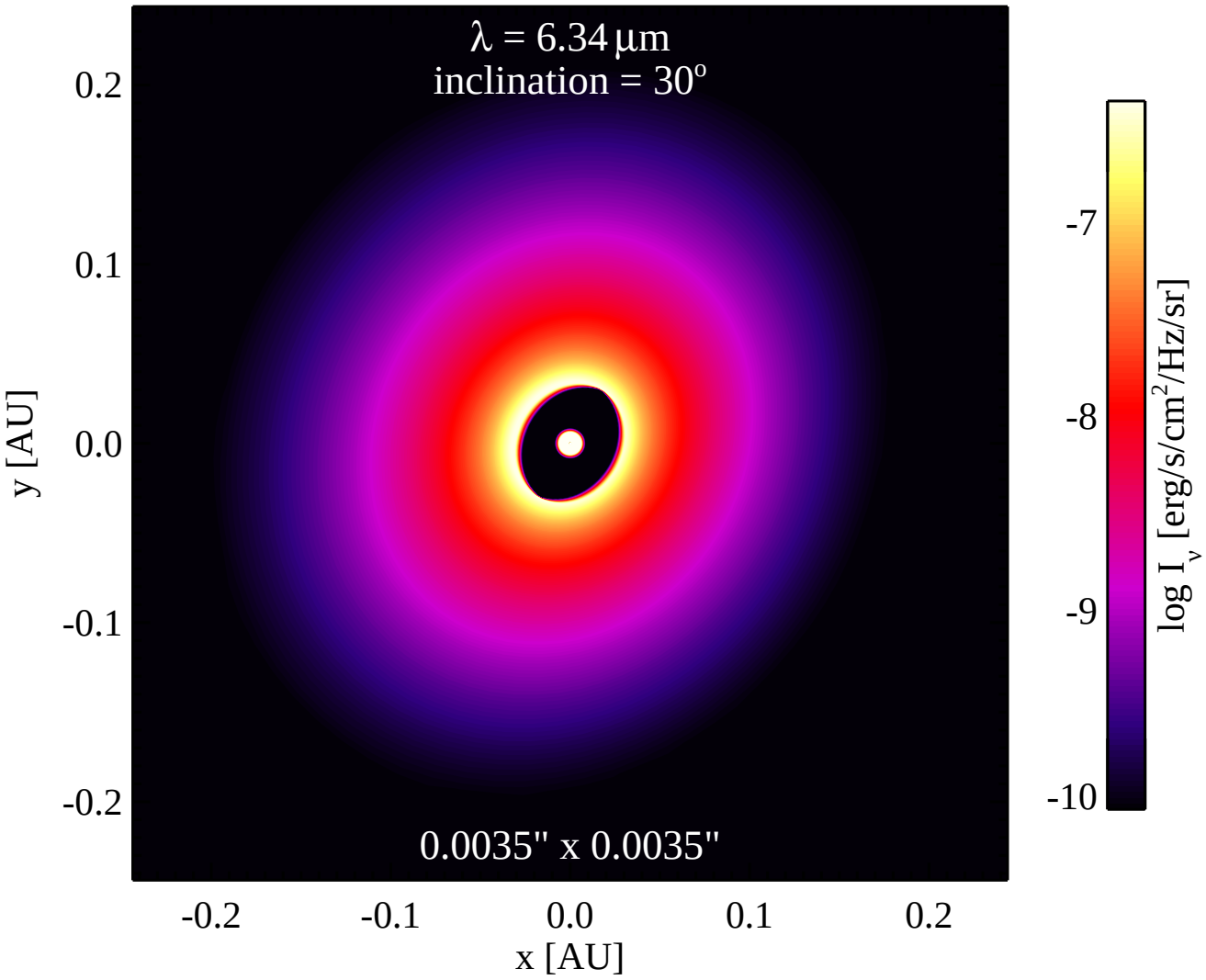

λ = 3.28 μm
inclination = 30°
0.092" x 0.092"
y [AU]
x [AU]
6
4
2
0
-2
-4
-6
-6
-4
-2
0
2
4
6
-11.5
-12.0
-12.5
-13.0
log I_ν [erg/s/cm²/Hz/sr]

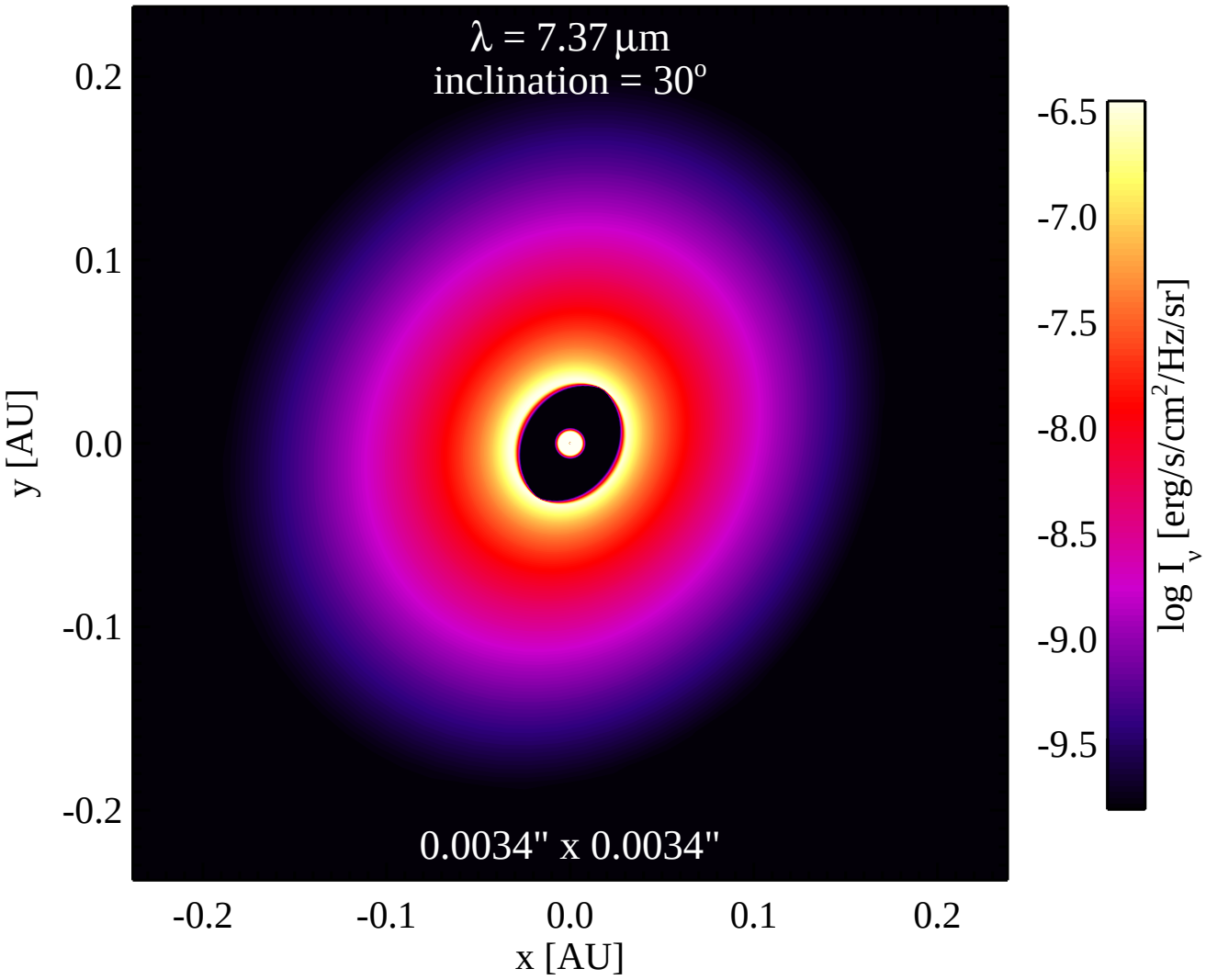

λ = 3.38 μm
inclination = 30°
0.095" x 0.095"
y [AU]
x [AU]
6
4
2
0
-2
-4
-6
-6
-4
-2
0
2
4
6
-11.5
-12.0
-12.5
-13.0
log I_ν [erg/s/cm²/Hz/sr]

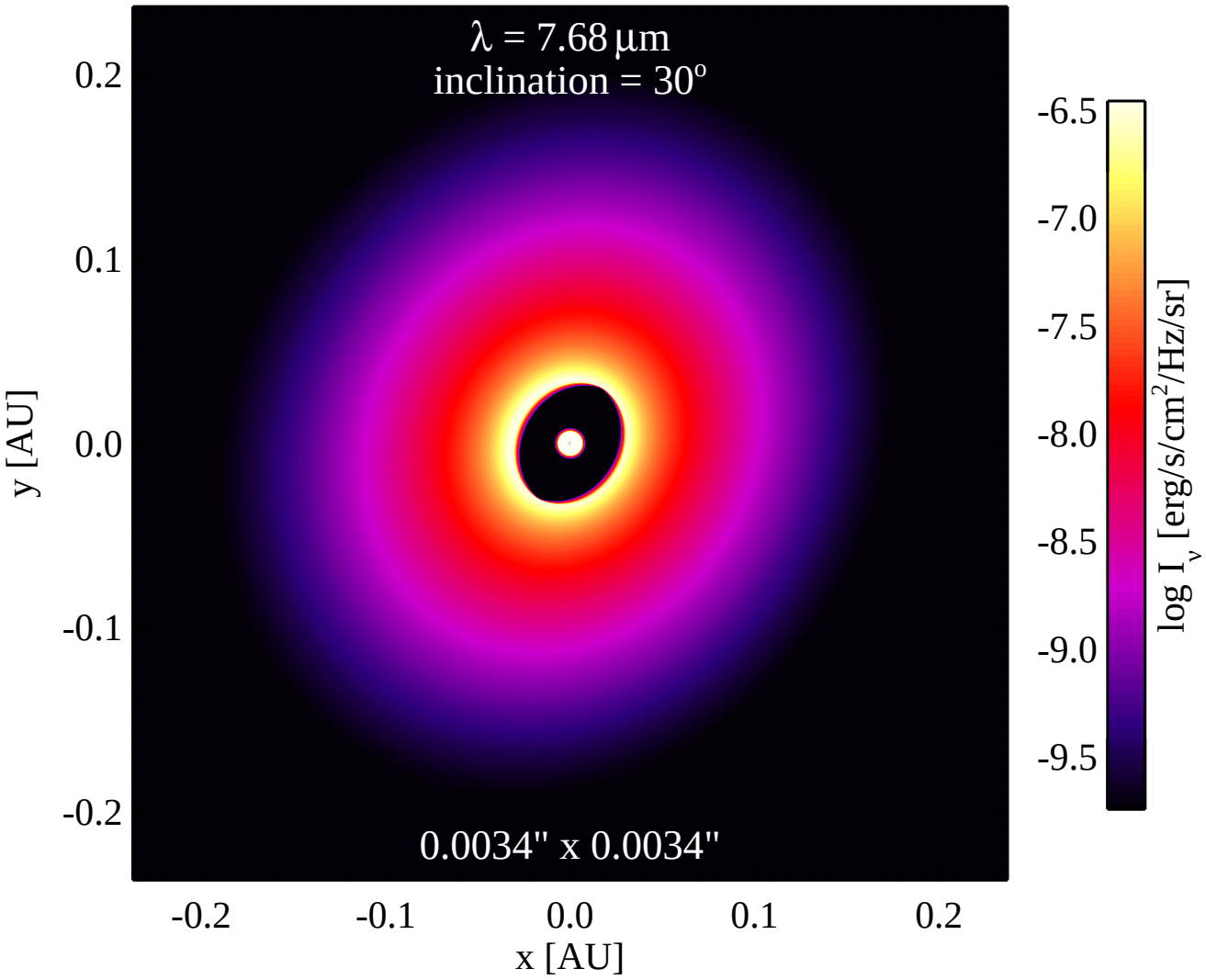

λ = 4.17 μm
inclination = 30°
0.068" x 0.068"
y [AU]
x [AU]
4
2
0
-2
-4
-4
-2
0
2
4
-10.5
-11.0
-11.5
-12.0
log I_ν [erg/s/cm²/Hz/sr]

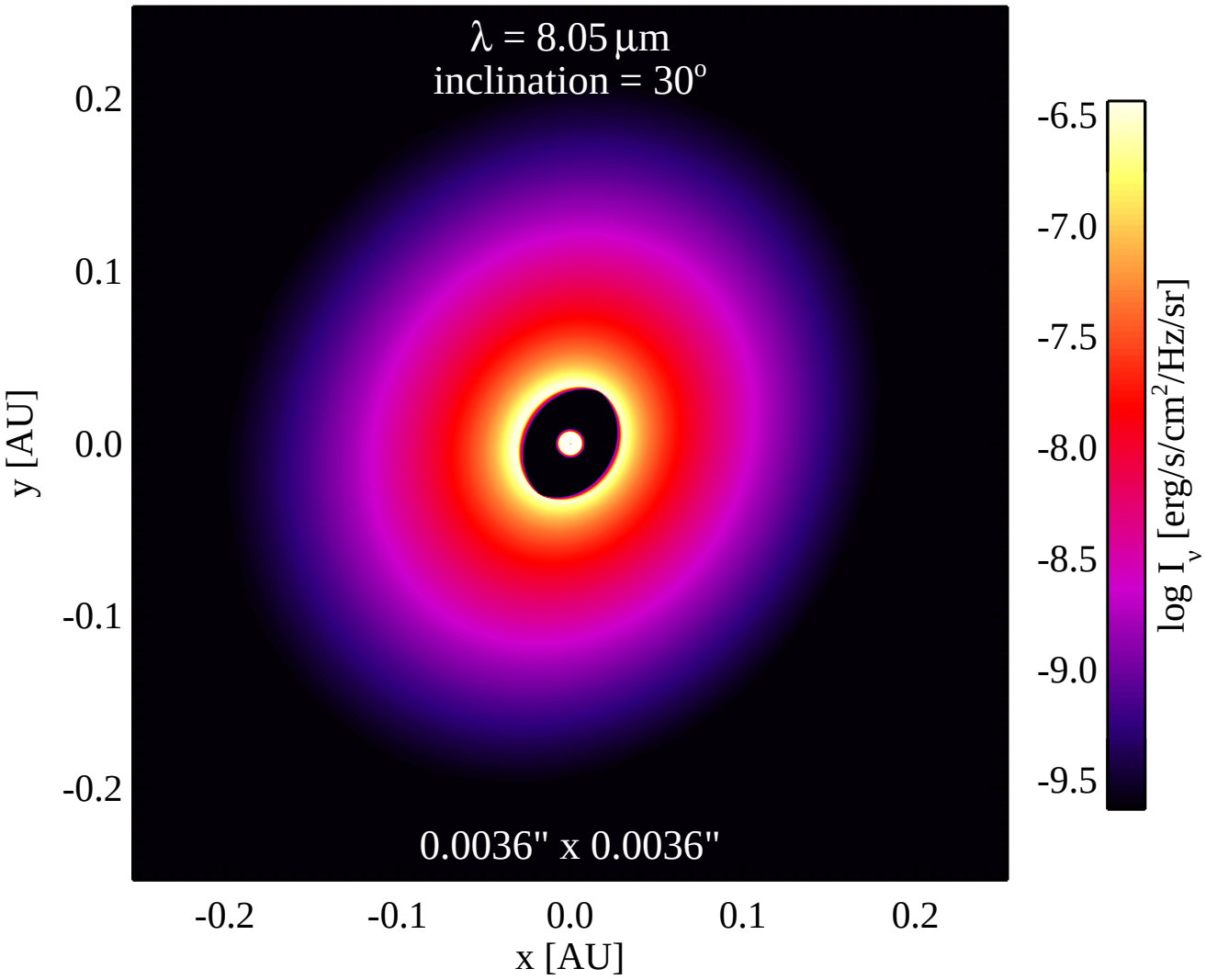

λ = 5.26 μm
inclination = 30°
0.0040" x 0.0040"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-7
-8
-9
-10
log I_ν [erg/s/cm²/Hz/sr]

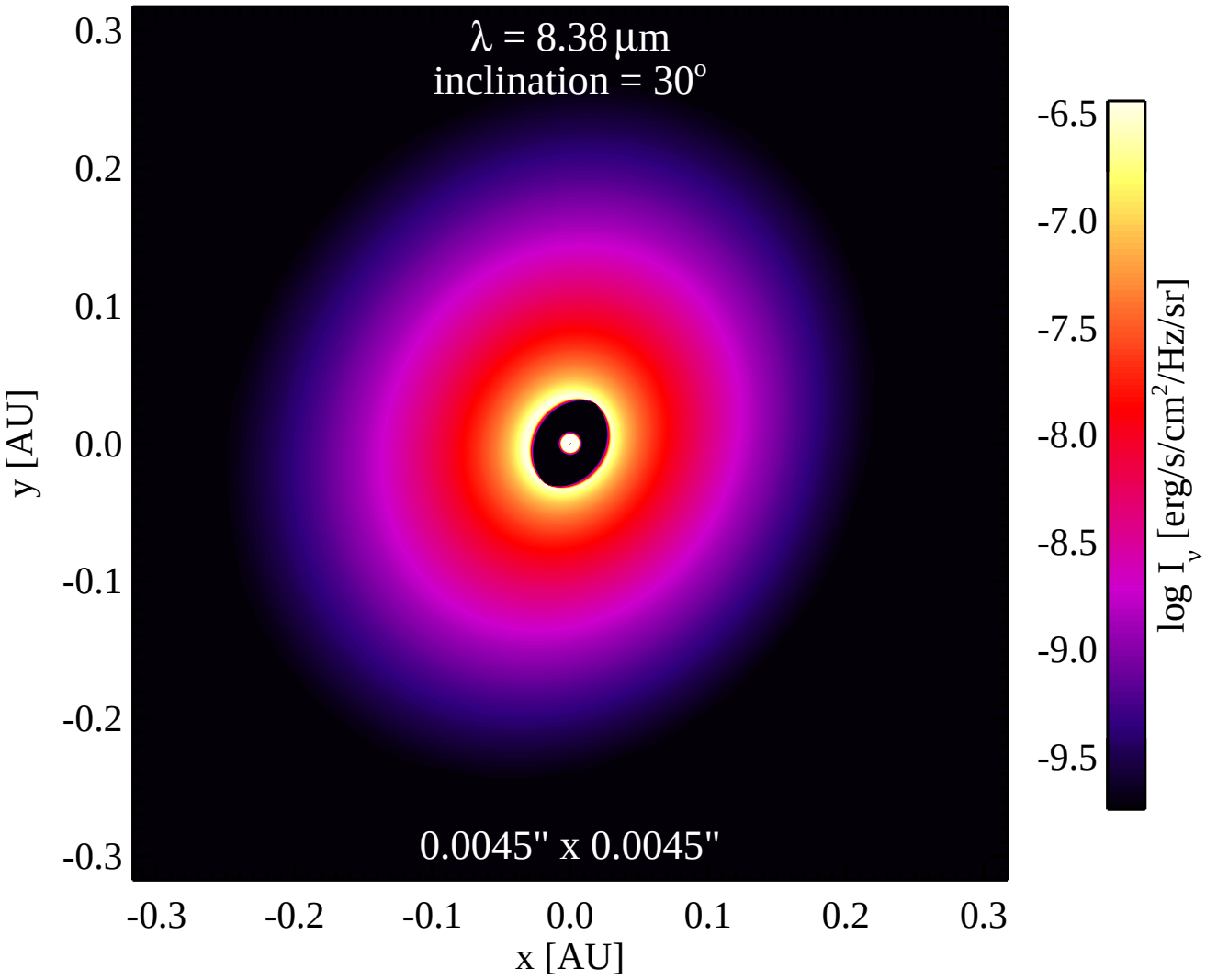

λ = 6.12 μm
inclination = 30°
0.0034" x 0.0034"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-7
-8
-9
log I_ν [erg/s/cm²/Hz/sr]

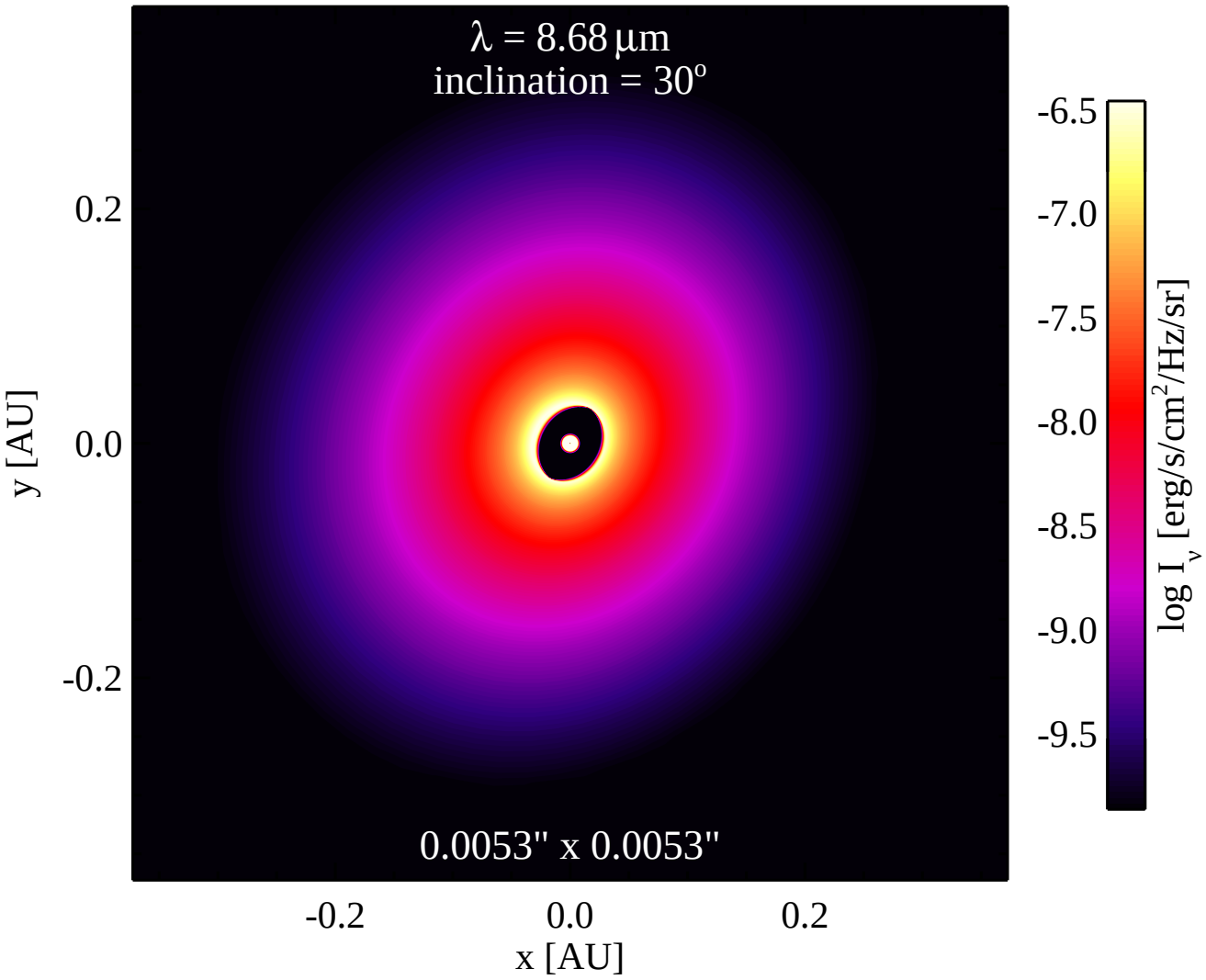

λ = 6.34 μm
inclination = 30°
0.0035" x 0.0035"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-7
-8
-9
-10
log I_ν [erg/s/cm²/Hz/sr]

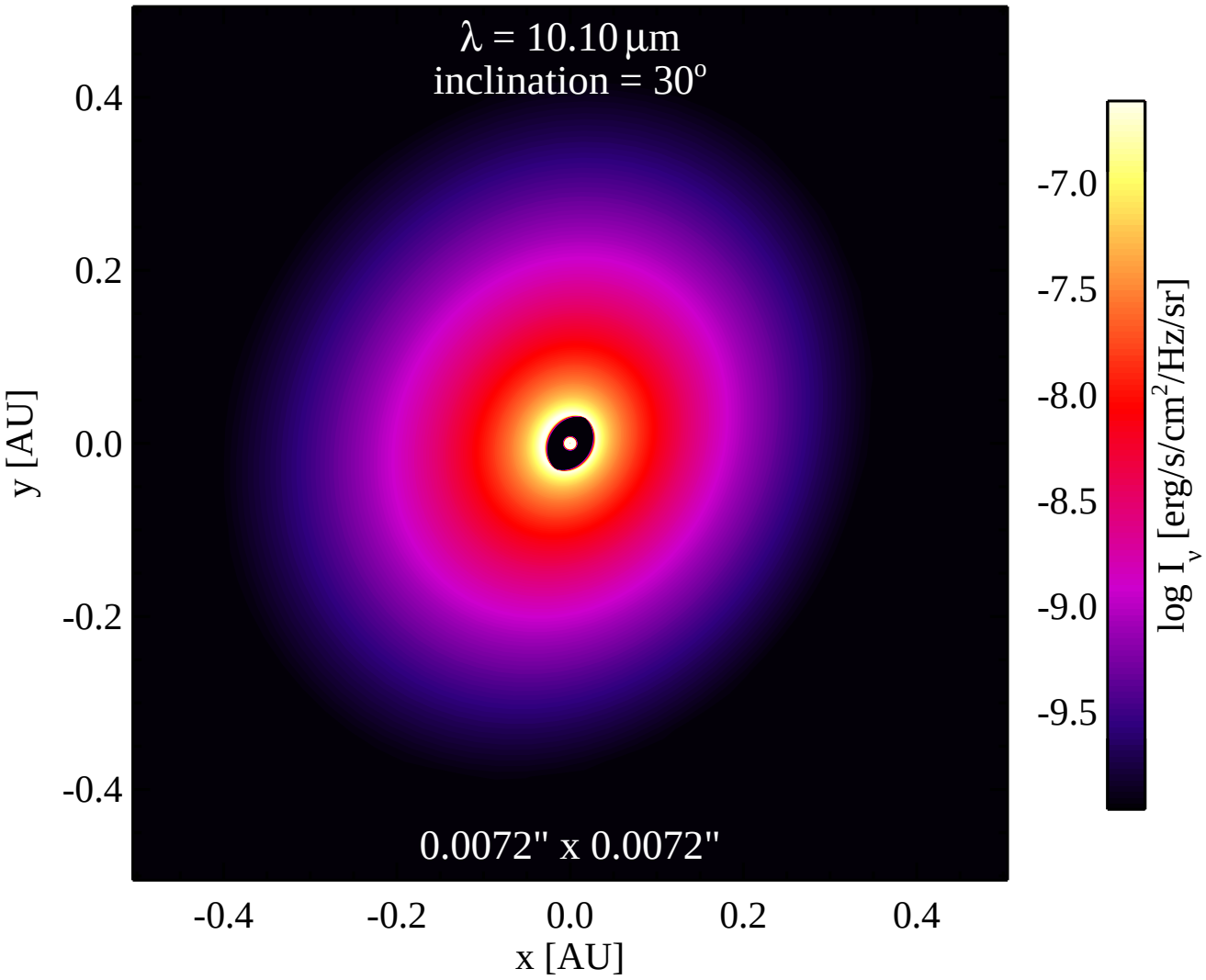

λ = 7.37 μm
inclination = 30°
0.0034" x 0.0034"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-6.5
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

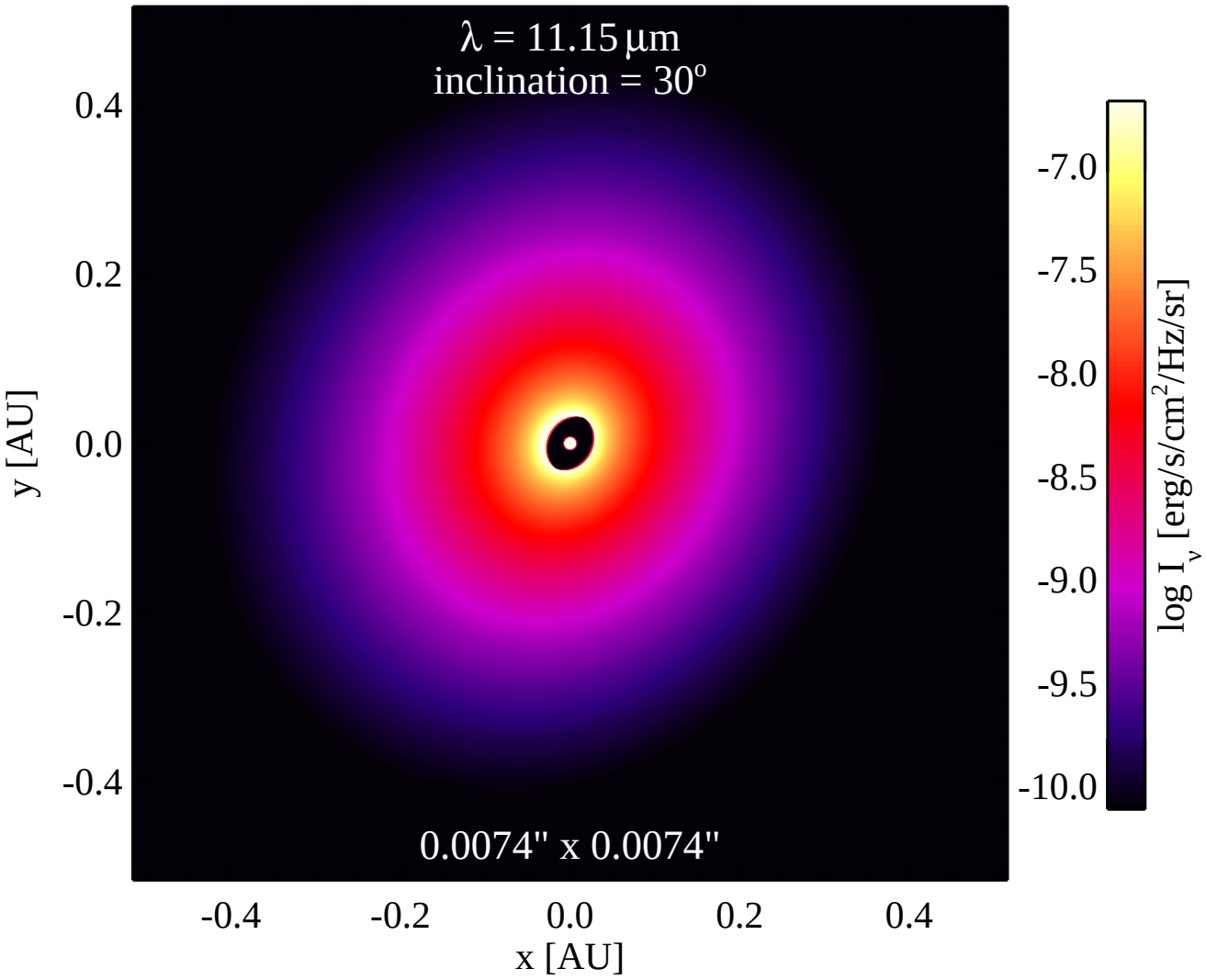

λ = 7.68 μm
inclination = 30°
0.0034" x 0.0034"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-6.5
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

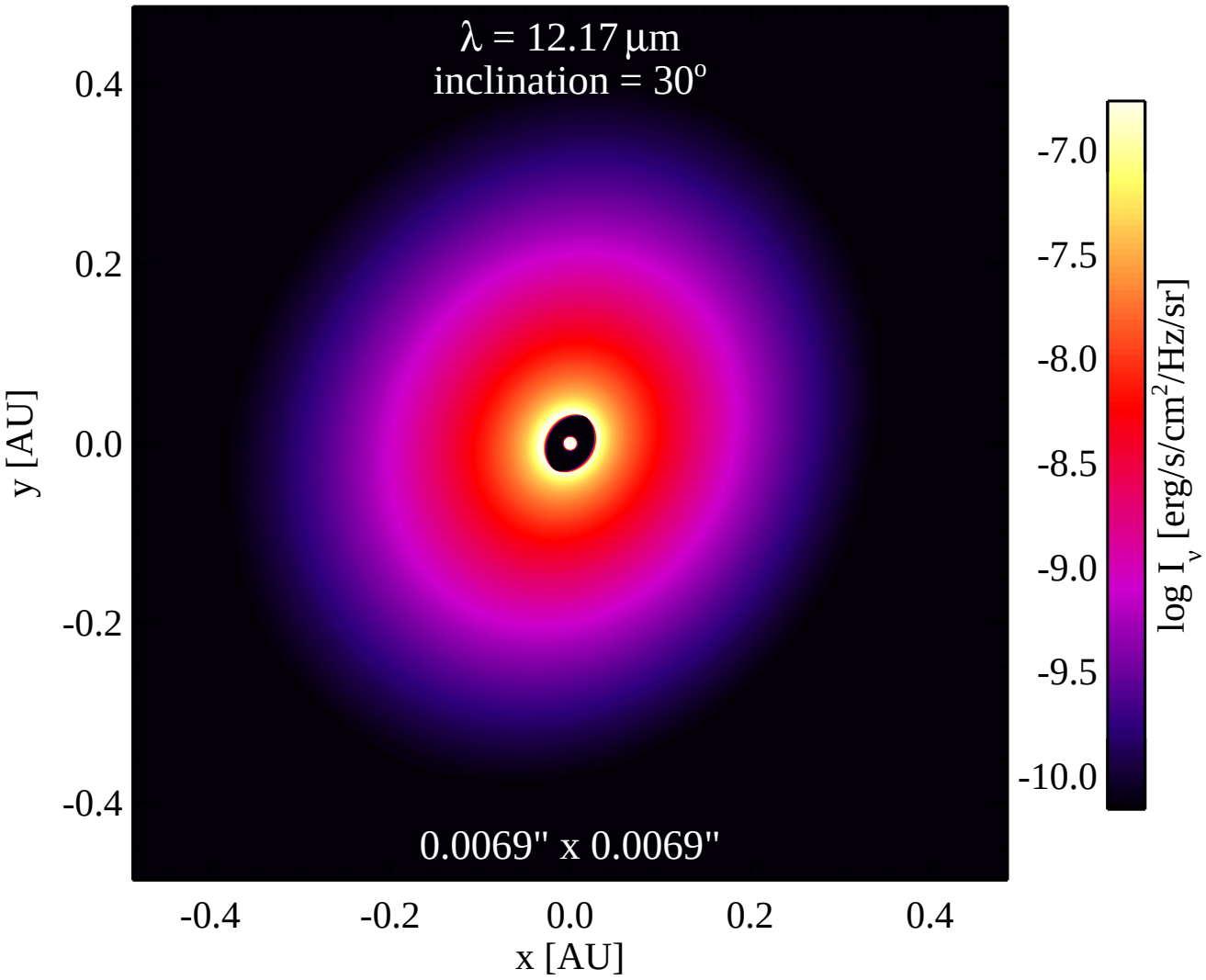

λ = 8.05 μm
inclination = 30°
0.0036" x 0.0036"
0.2
0.1
0.0
-0.1
-0.2
y [AU]
-0.2
-0.1
0.0
0.1
0.2
x [AU]
-6.5
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

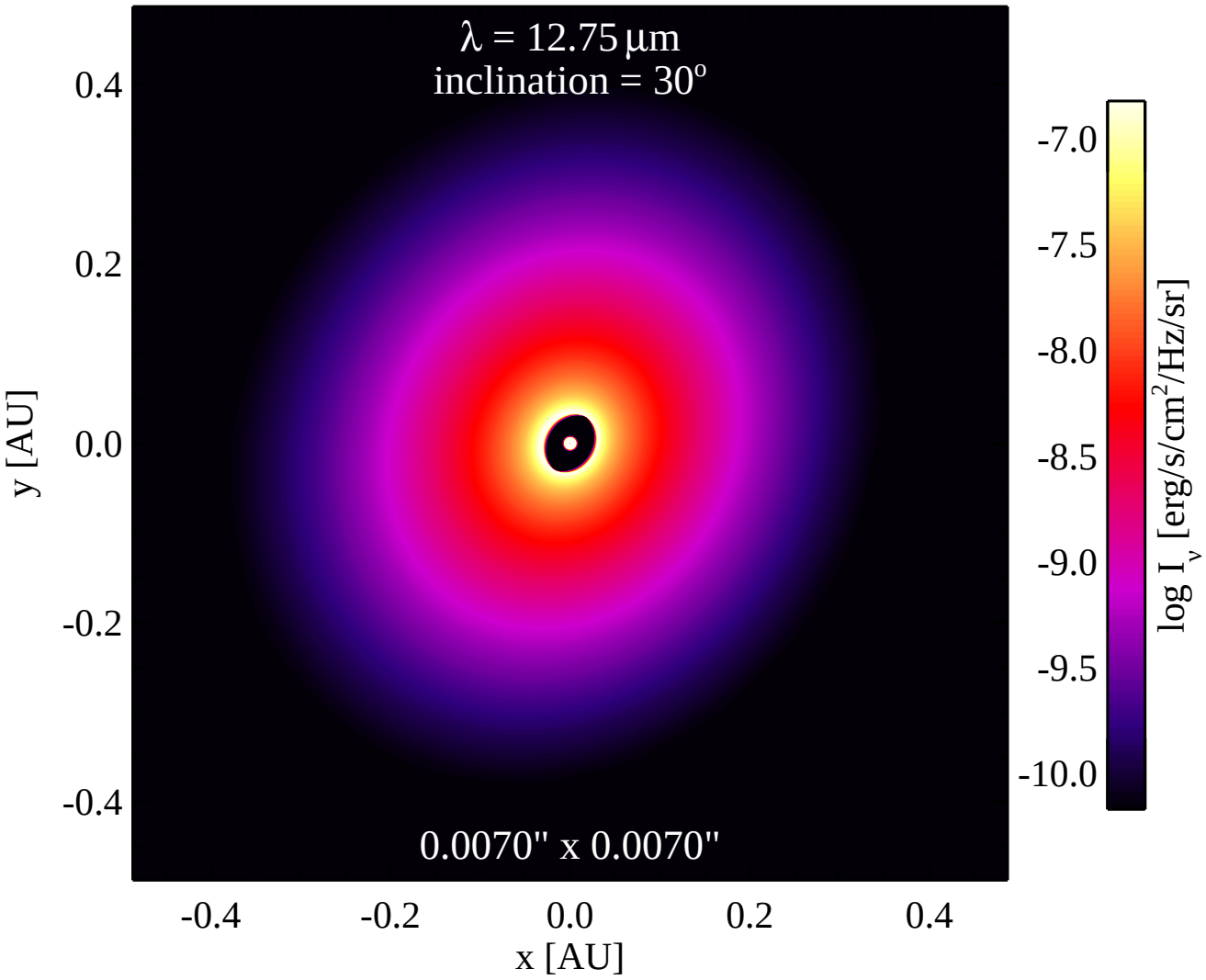

λ = 8.38 μm
inclination = 30°
0.0045" x 0.0045"
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
y [AU]
-0.3
-0.2
-0.1
0.0
0.1
0.2
0.3
x [AU]
-6.5
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

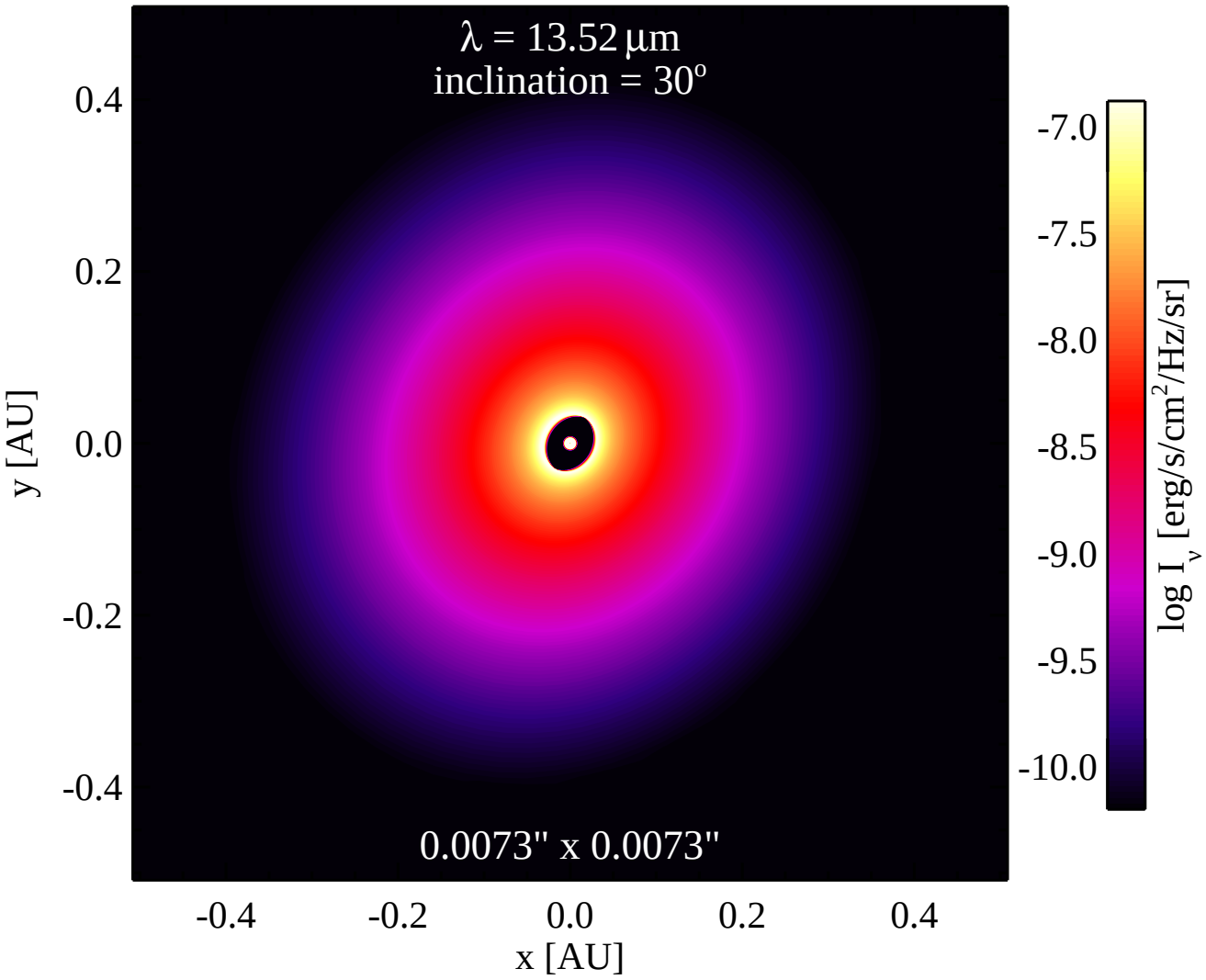

λ = 8.68 μm
inclination = 30°
0.0053" x 0.0053"
0.2
0.0
-0.2
y [AU]
-0.2
0.0
0.2
x [AU]
-6.5
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

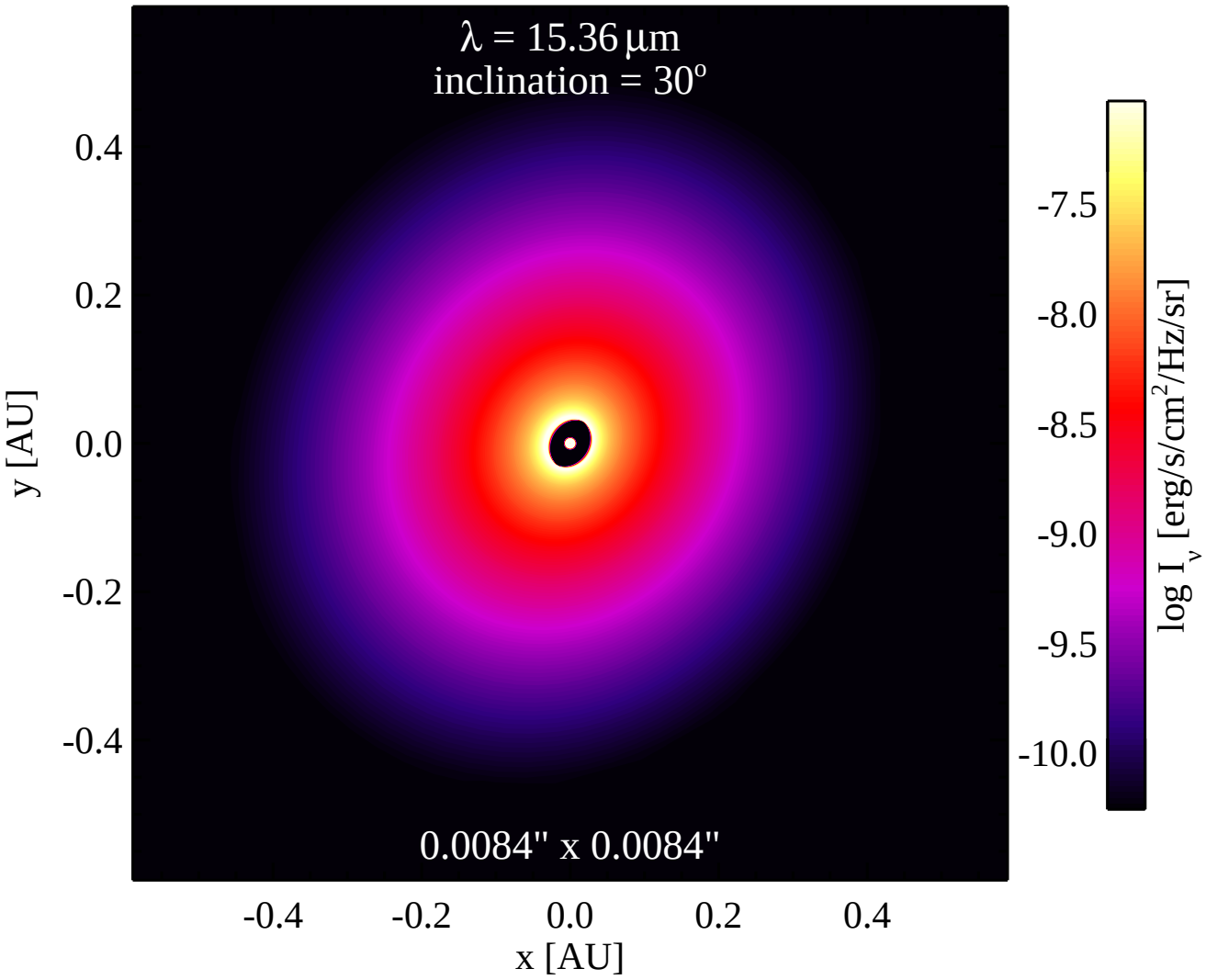

λ = 10.10 μm
inclination = 30°
0.0072" x 0.0072"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
log I_ν [erg/s/cm²/Hz/sr]

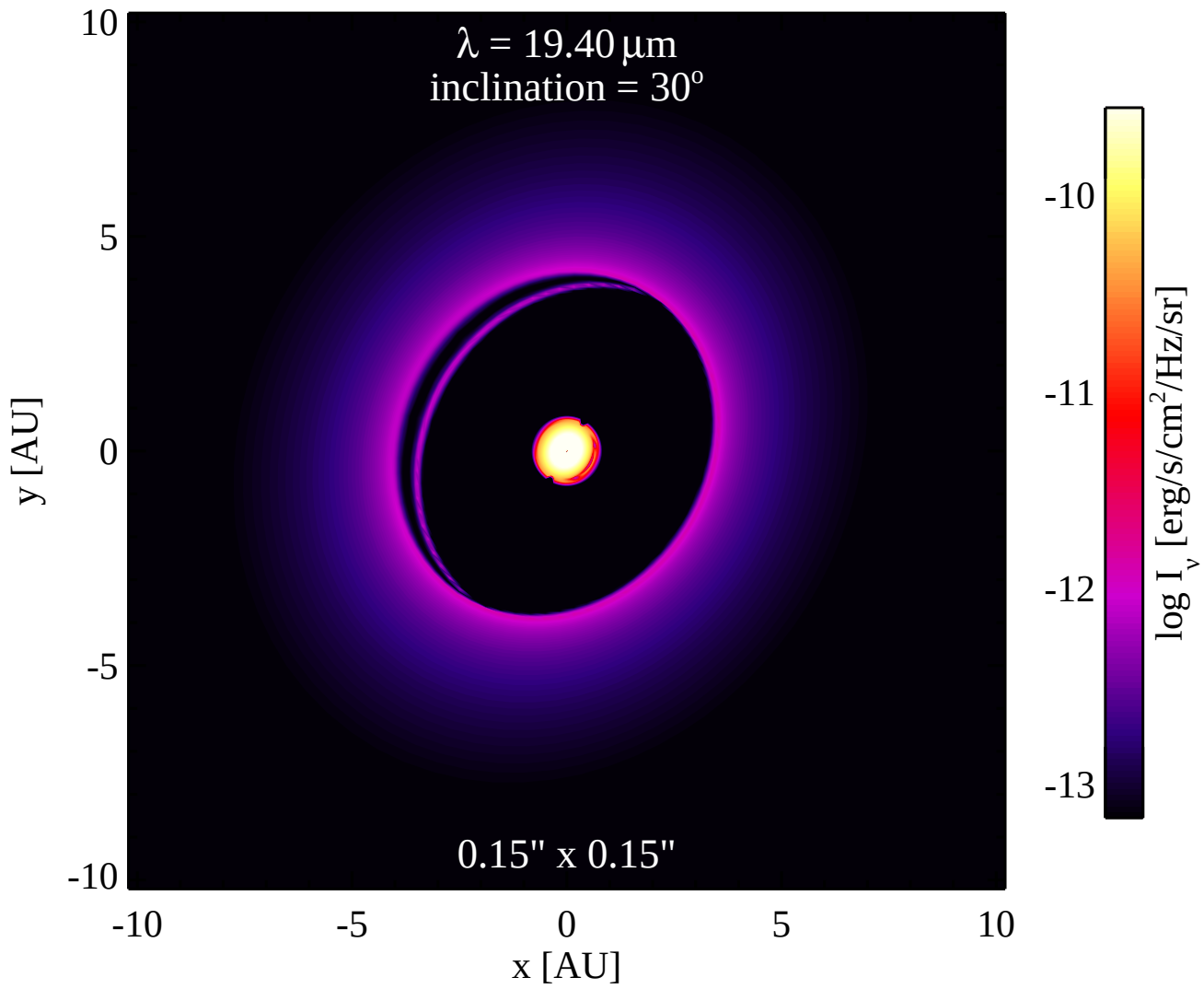

λ = 11.15 μm
inclination = 30°
0.0074" x 0.0074"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
-10.0
log I_ν [erg/s/cm²/Hz/sr]

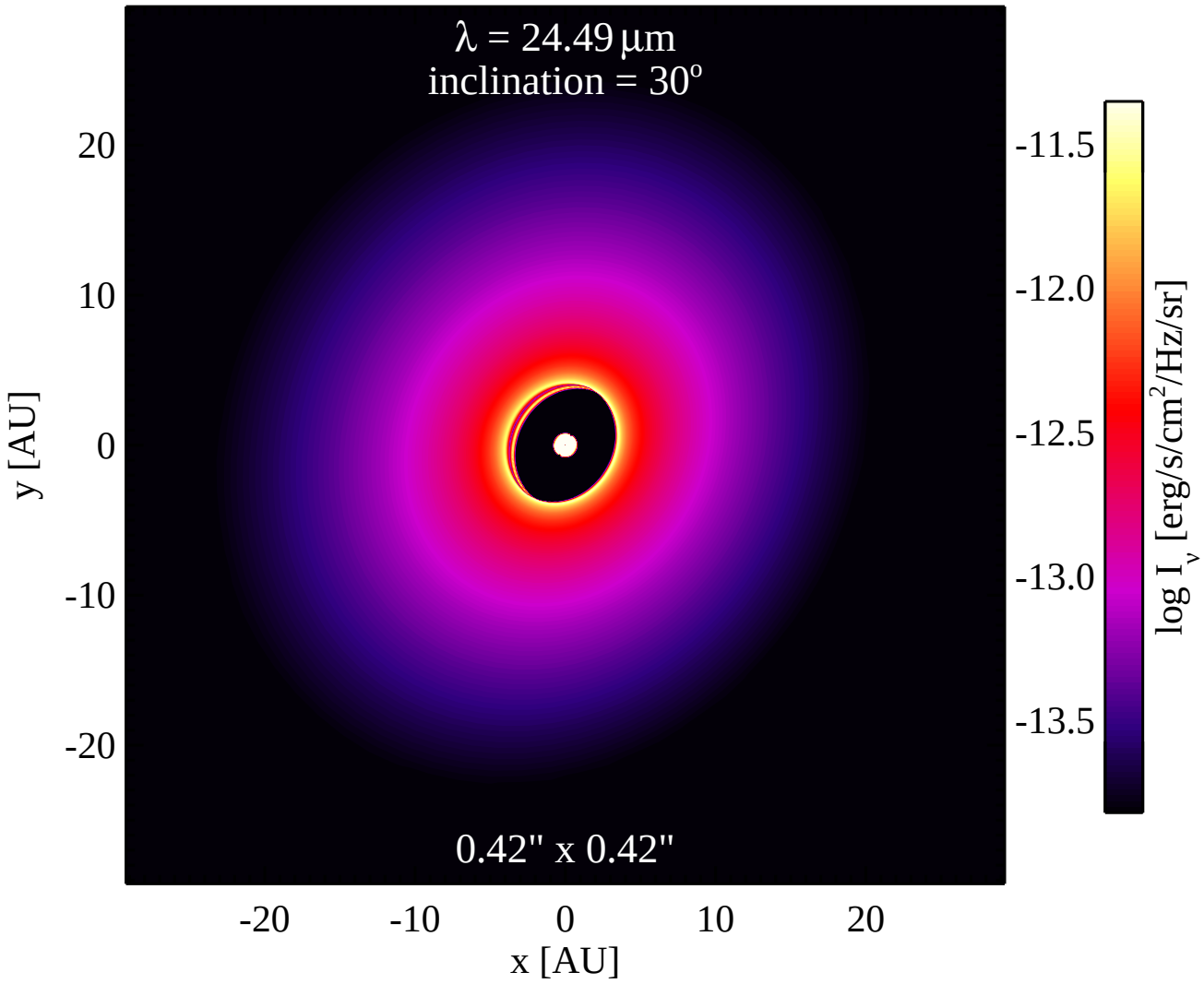

λ = 12.17 μm
inclination = 30°
0.0069" x 0.0069"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
-10.0
log I_ν [erg/s/cm²/Hz/sr]

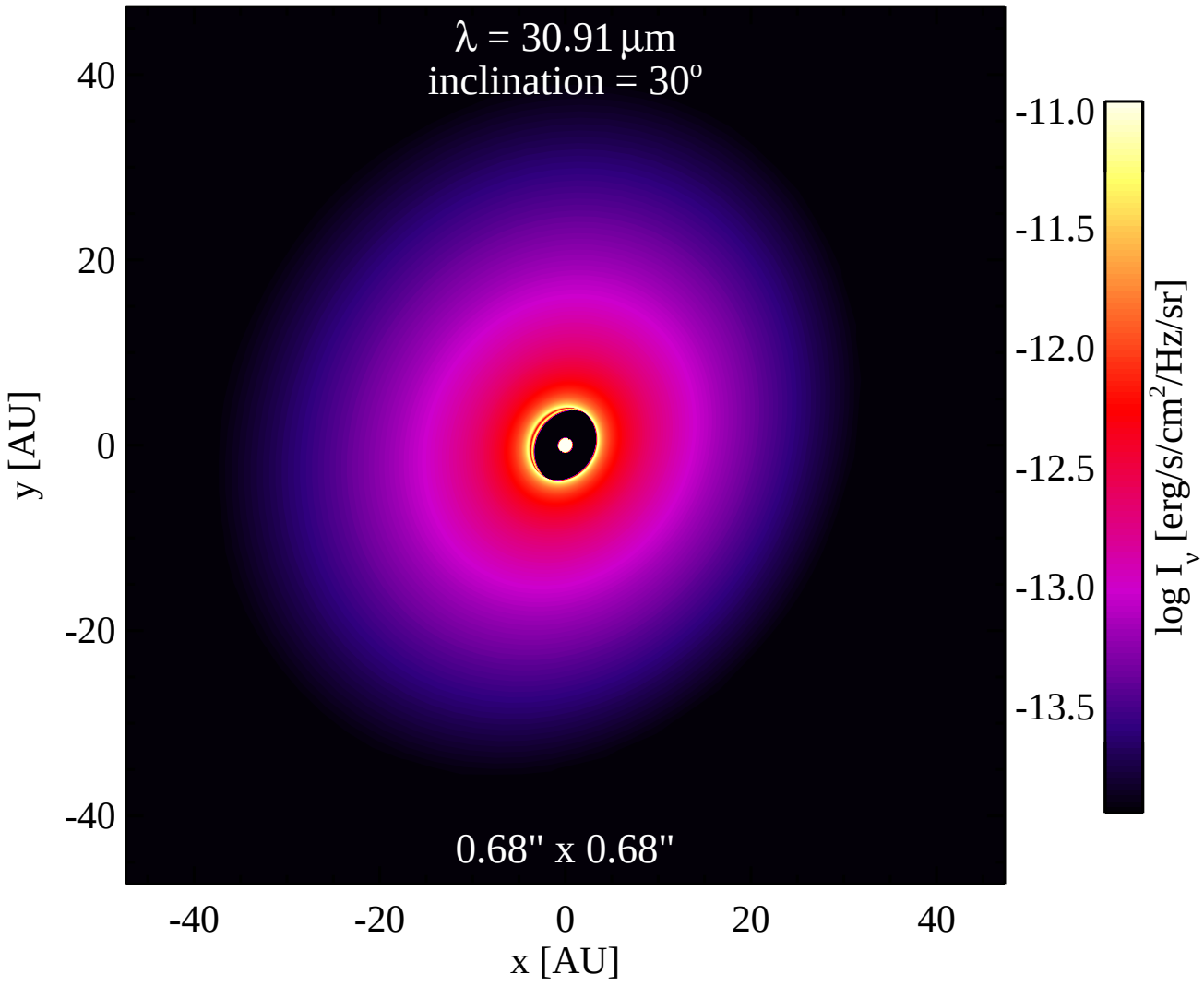

λ = 12.75 μm
inclination = 30°
0.0070" x 0.0070"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
-10.0
log I_ν [erg/s/cm²/Hz/sr]

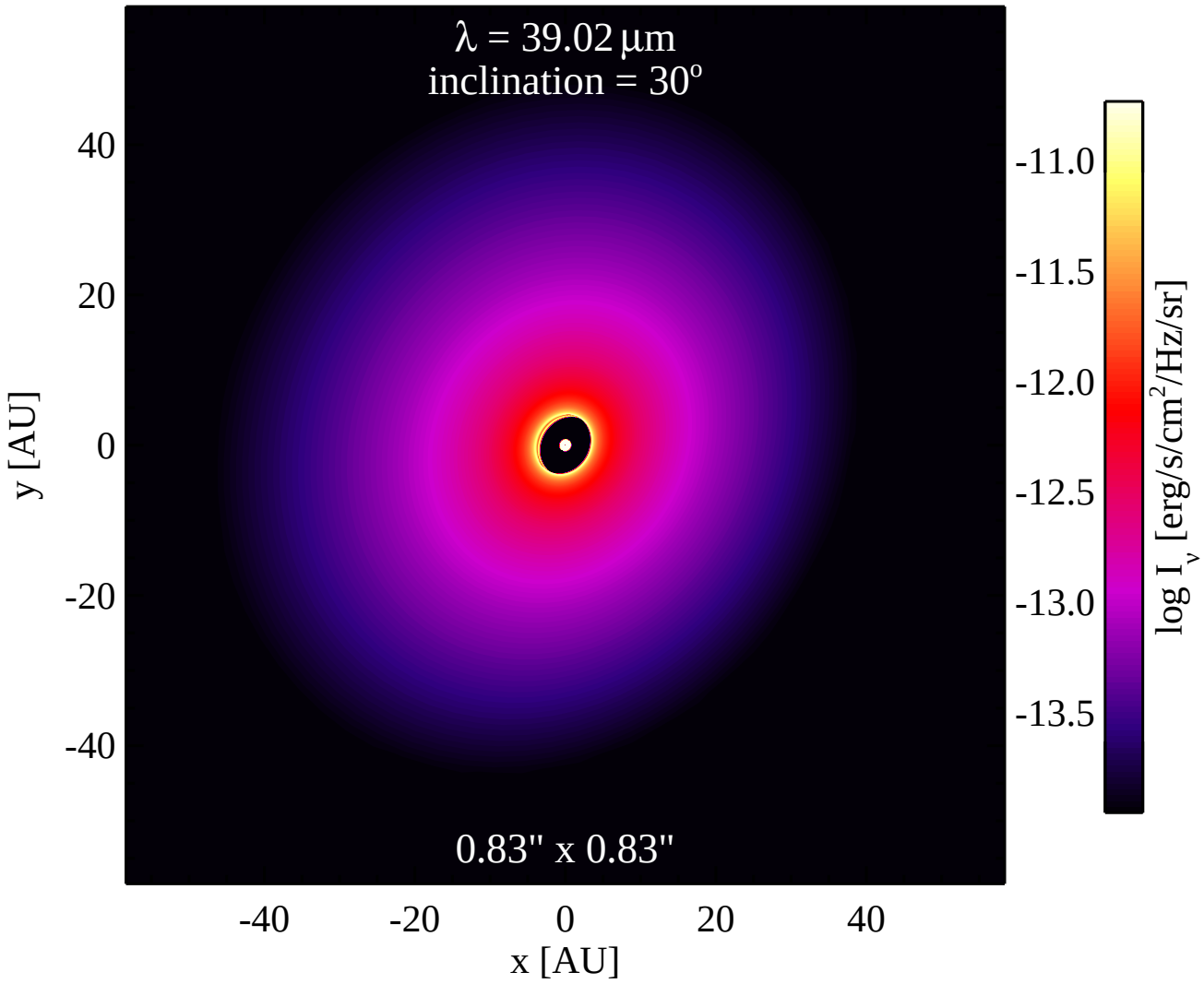

λ = 13.52 μm
inclination = 30°
0.0073" x 0.0073"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.0
-7.5
-8.0
-8.5
-9.0
-9.5
-10.0
log I_ν [erg/s/cm²/Hz/sr]

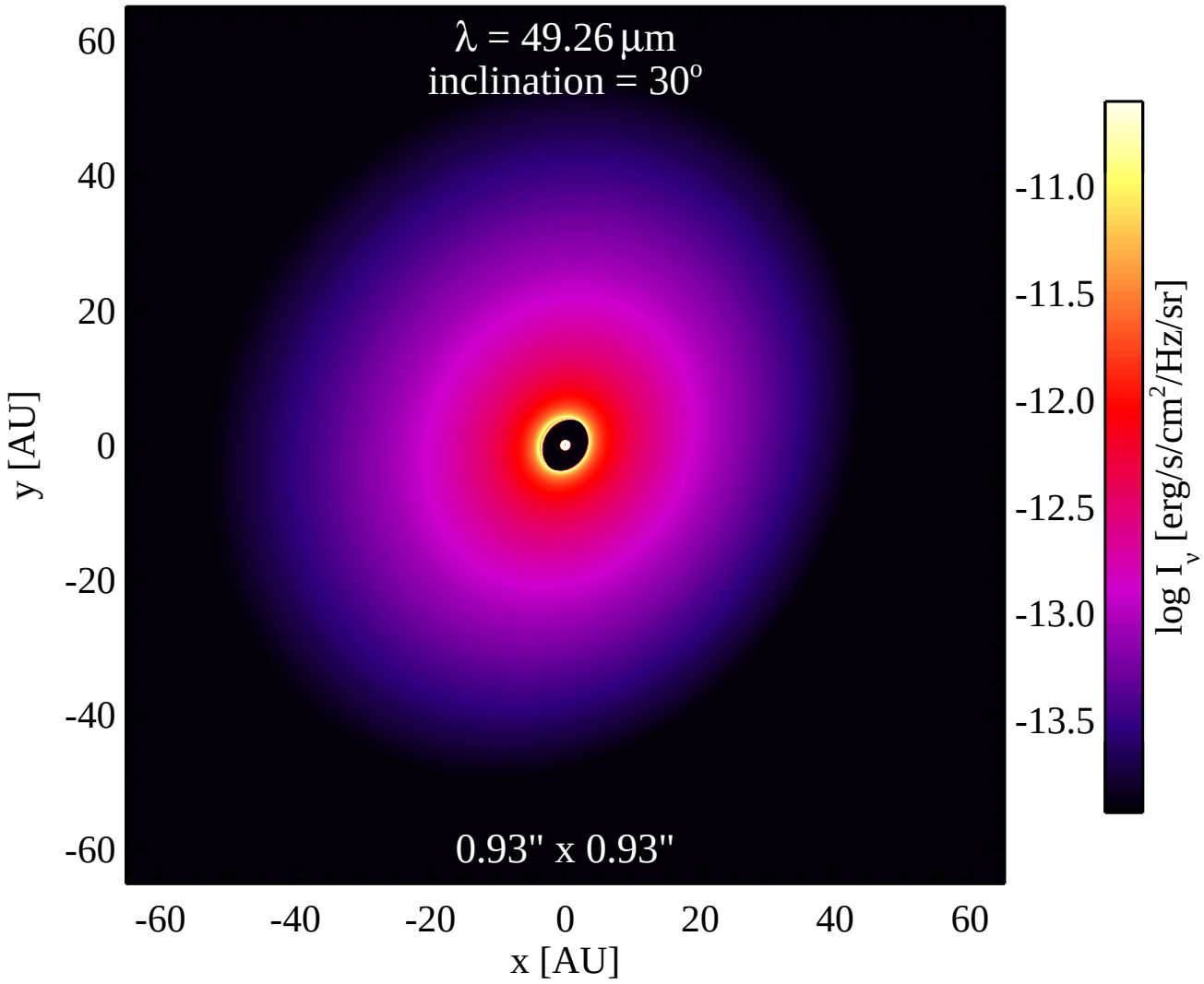

λ = 15.36 μm
inclination = 30°
0.0084" x 0.0084"
0.4
0.2
0.0
-0.2
-0.4
y [AU]
-0.4
-0.2
0.0
0.2
0.4
x [AU]
-7.5
-8.0
-8.5
-9.0
-9.5
-10.0
log I_ν [erg/s/cm²/Hz/sr]

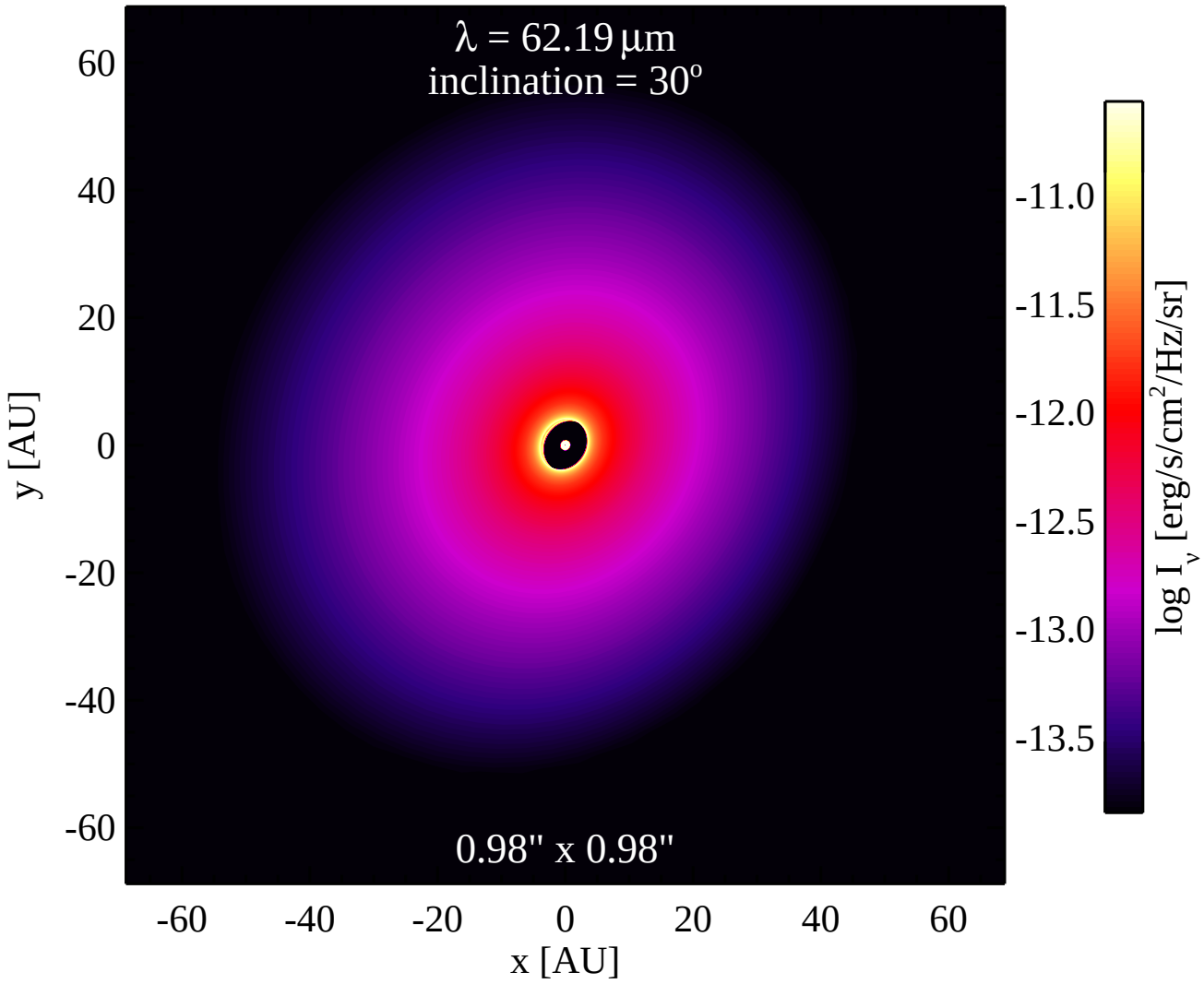

λ = 19.40 μm
inclination = 30°
0.15" x 0.15"
10
5
0
-5
-10
y [AU]
-10
-5
0
5
10
x [AU]
-10
-11
-12
-13
log I_ν [erg/s/cm²/Hz/sr]

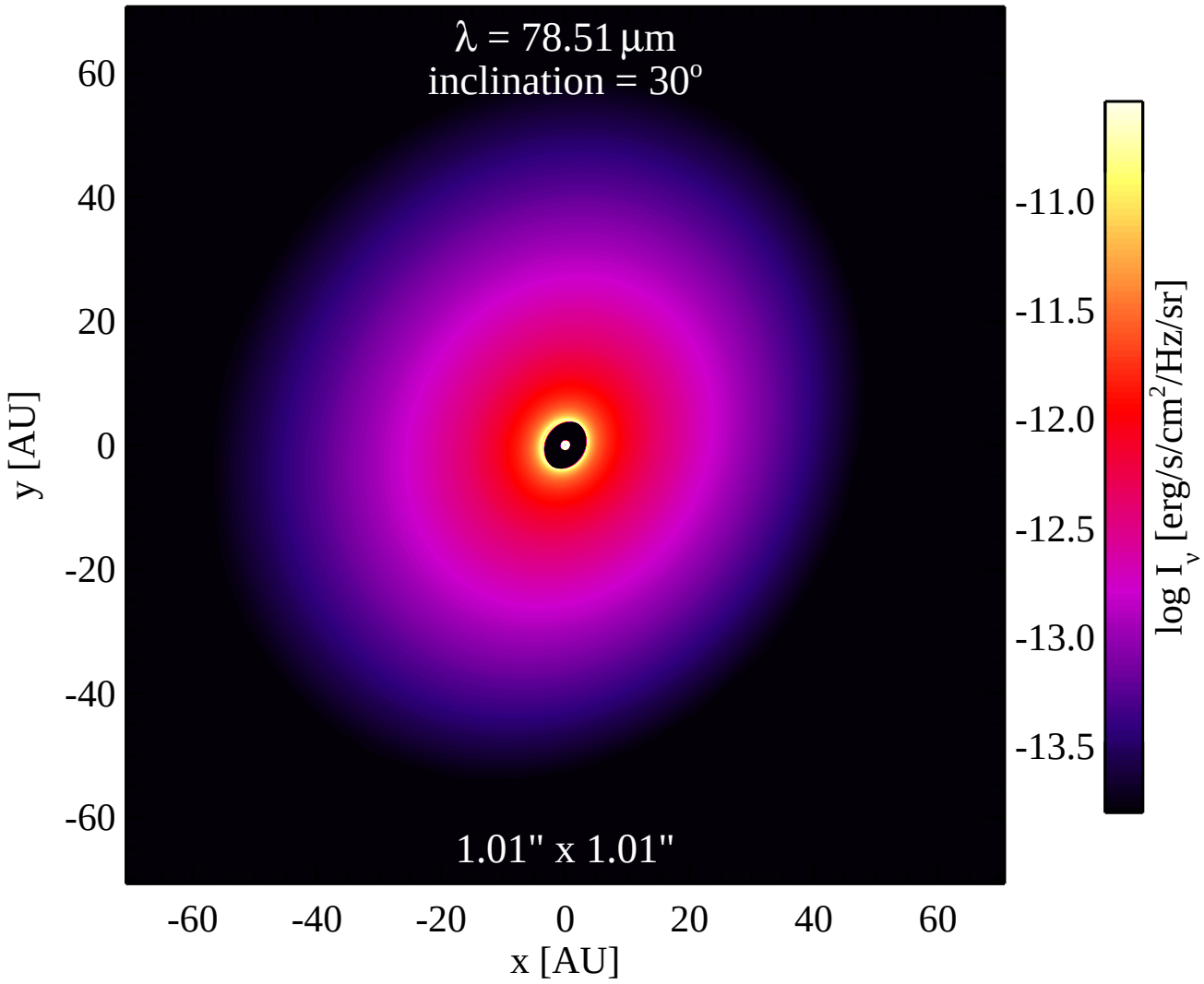

λ = 24.49 μm
inclination = 30°
0.42" x 0.42"
20
10
0
-10
-20
y [AU]
-20
-10
0
10
20
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

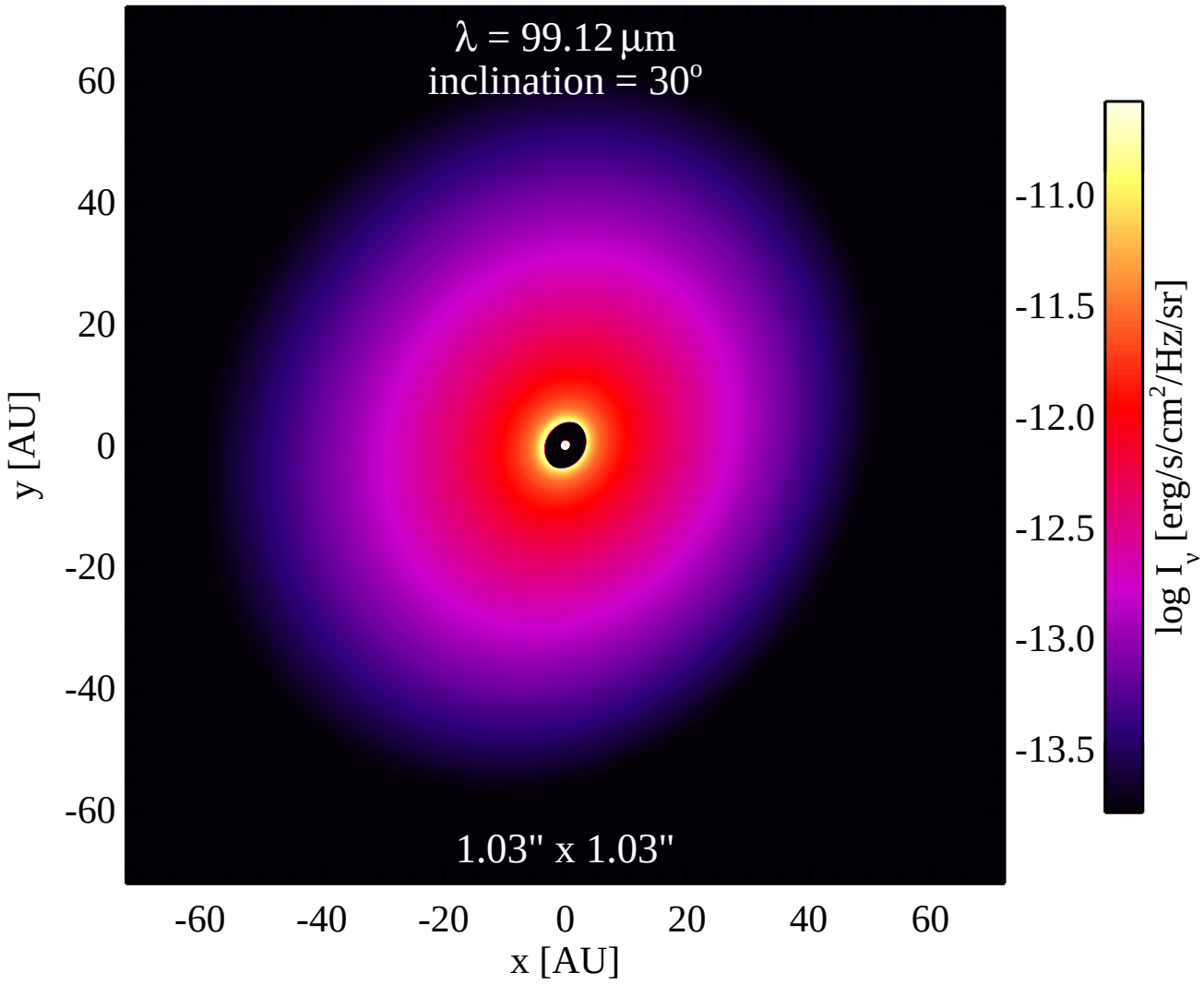

λ = 30.91 μm
inclination = 30°
0.68" x 0.68"
40
20
0
-20
-40
y [AU]
-40
-20
0
20
40
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

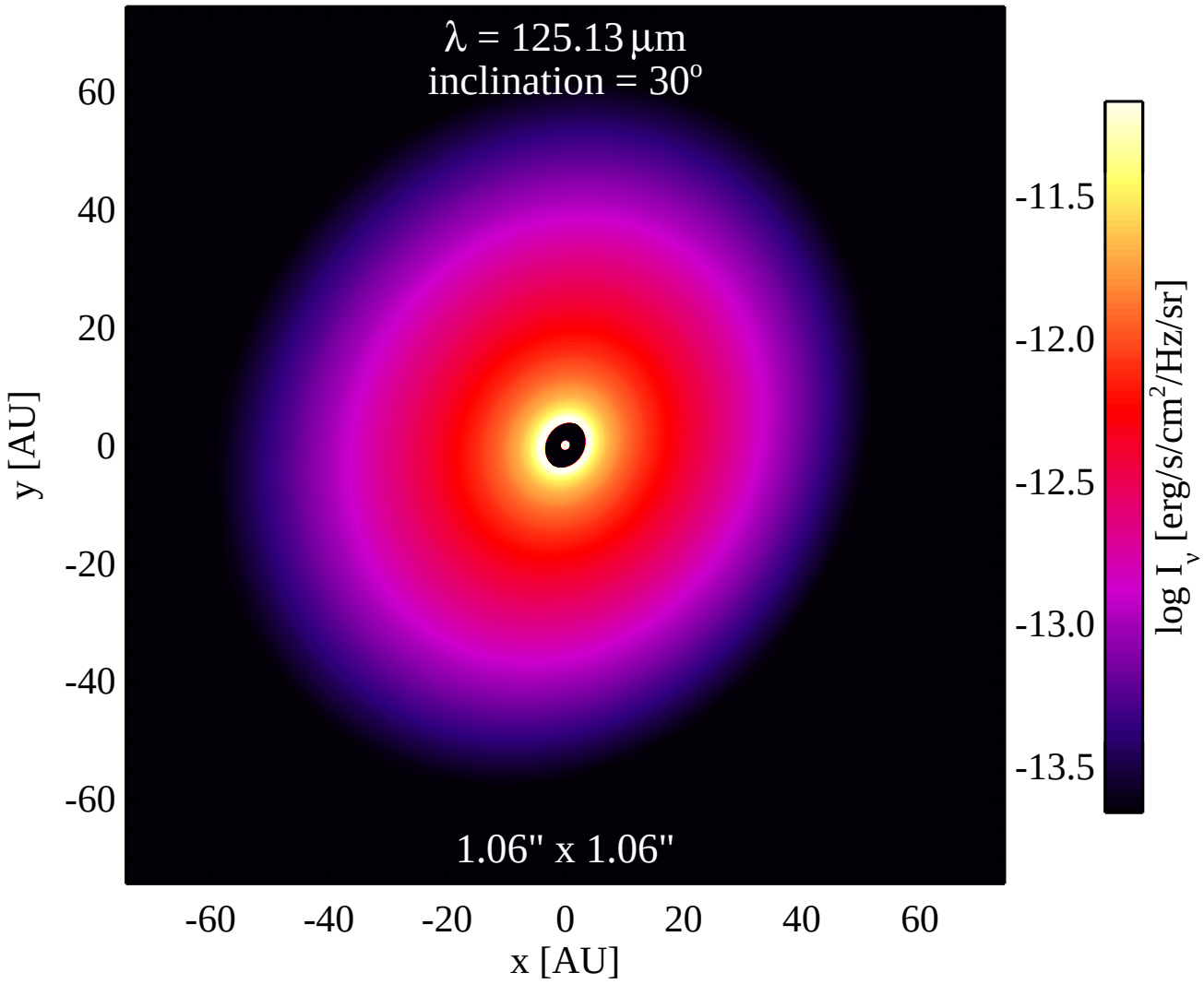

λ = 39.02 μm
inclination = 30°
0.83" x 0.83"
40
20
0
-20
-40
y [AU]
-40
-20
0
20
40
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

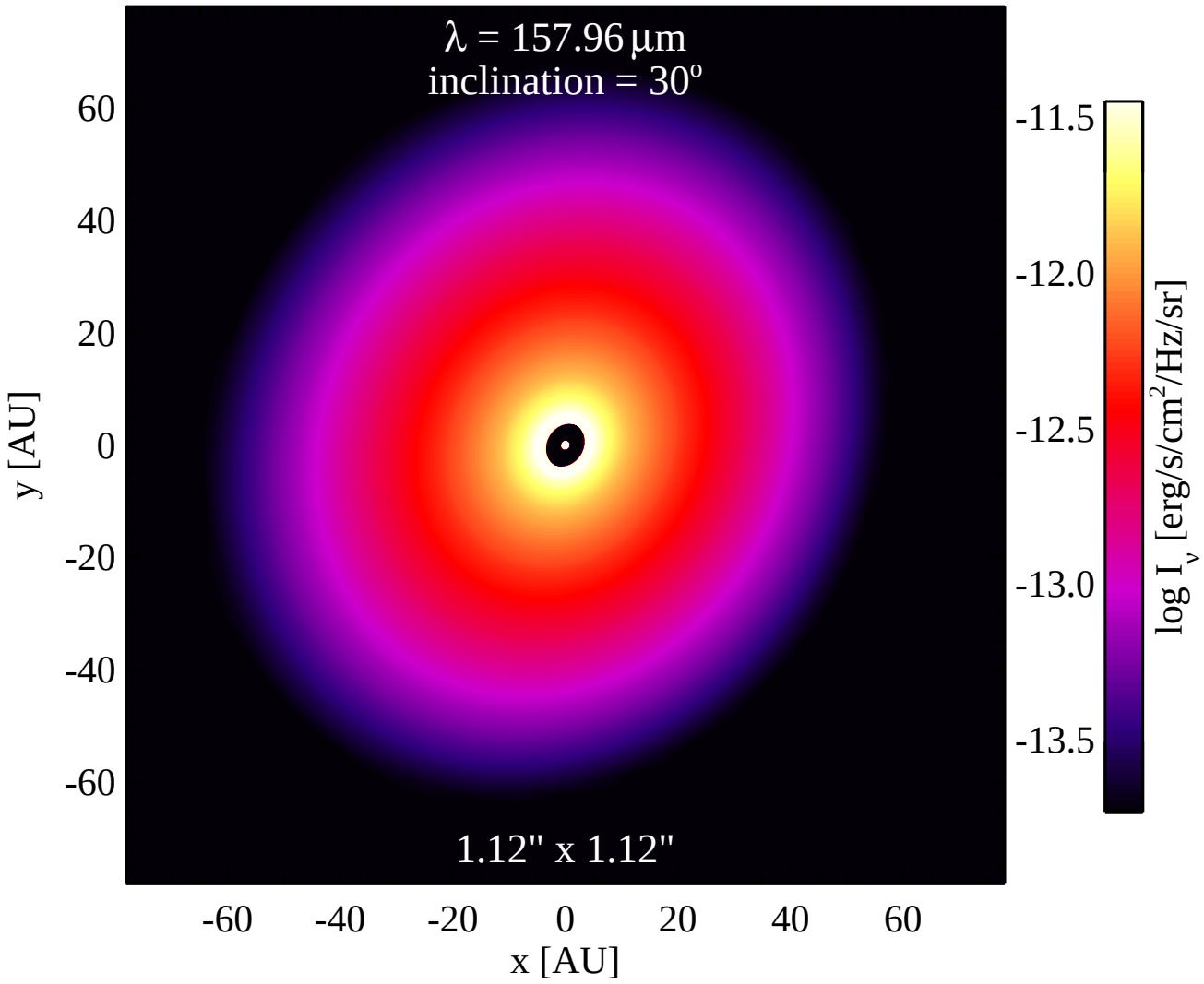

λ = 49.26 μm
inclination = 30°
0.93" x 0.93"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

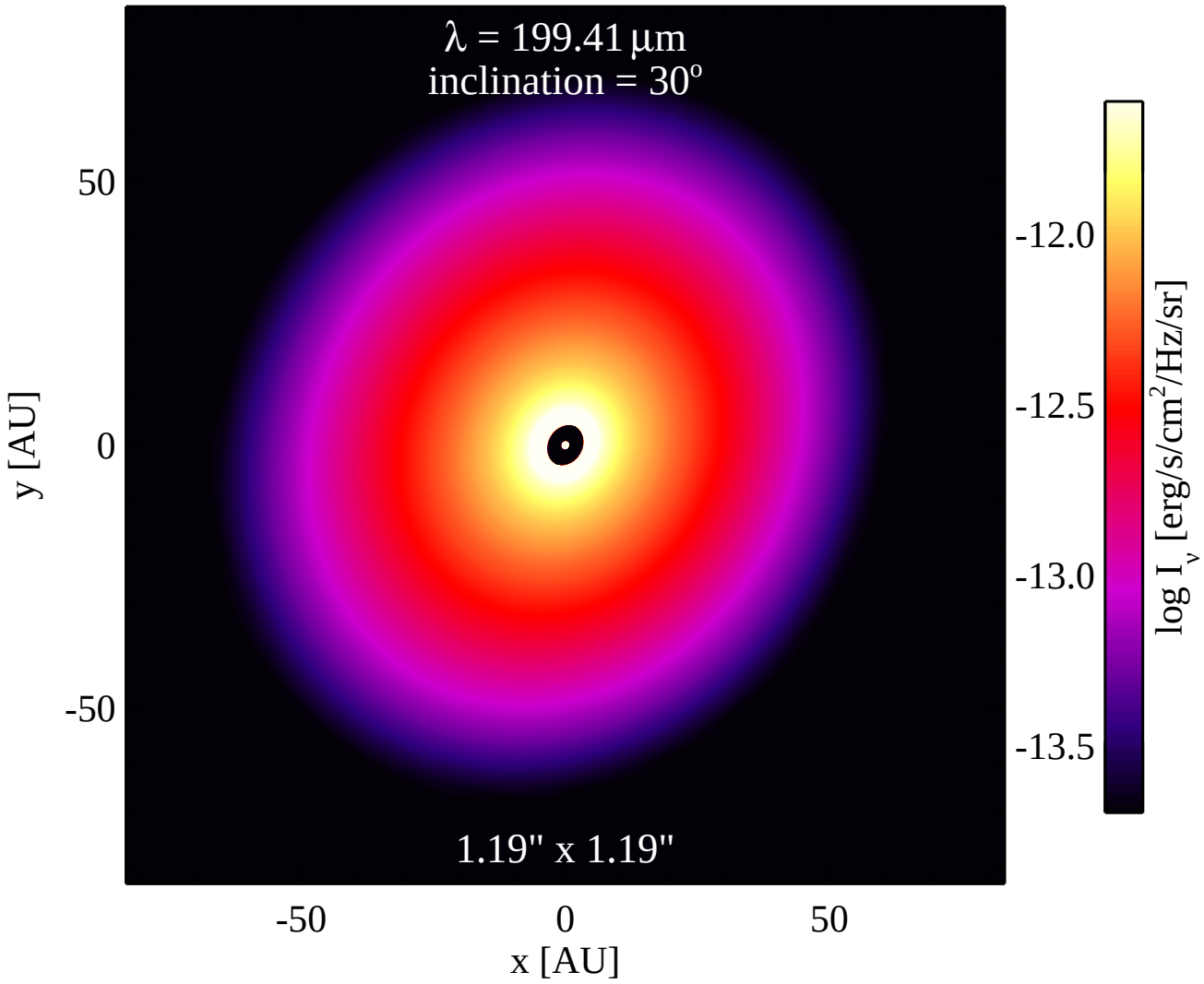

λ = 62.19 μm
inclination = 30°
0.98" x 0.98"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

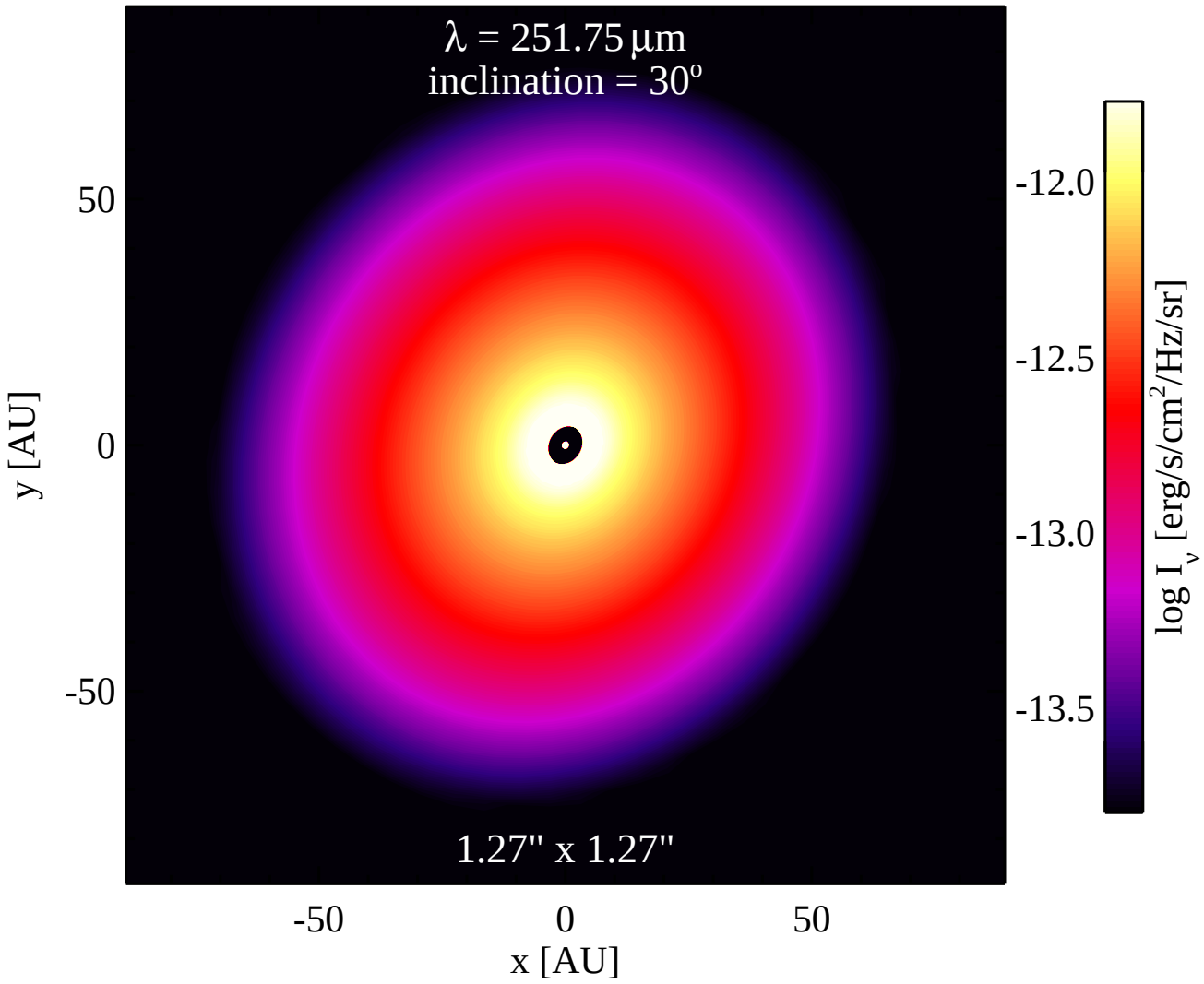

λ = 78.51 μm
inclination = 30°
1.01" x 1.01"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

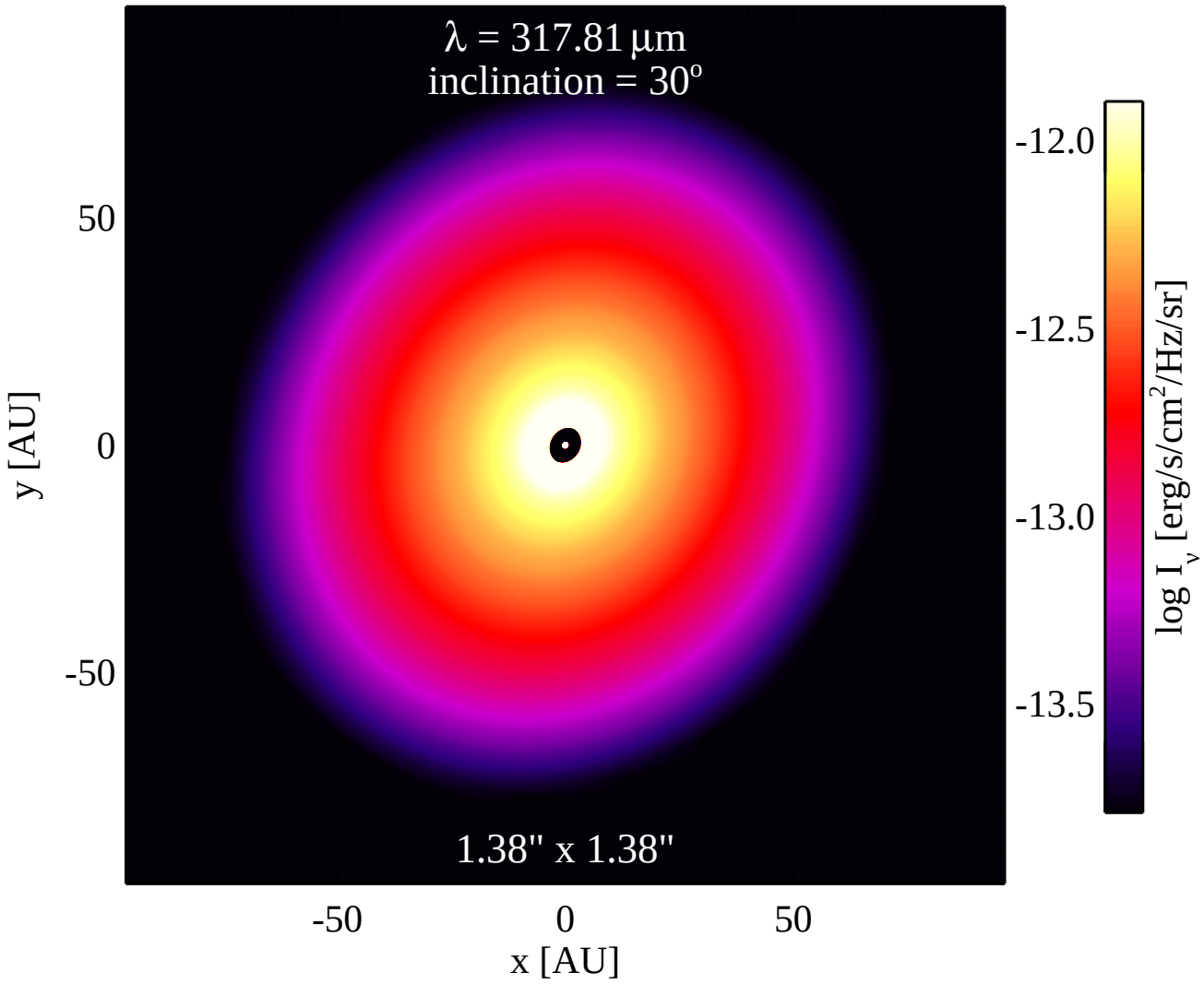

λ = 99.12 μm
inclination = 30°
1.03" x 1.03"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.0
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

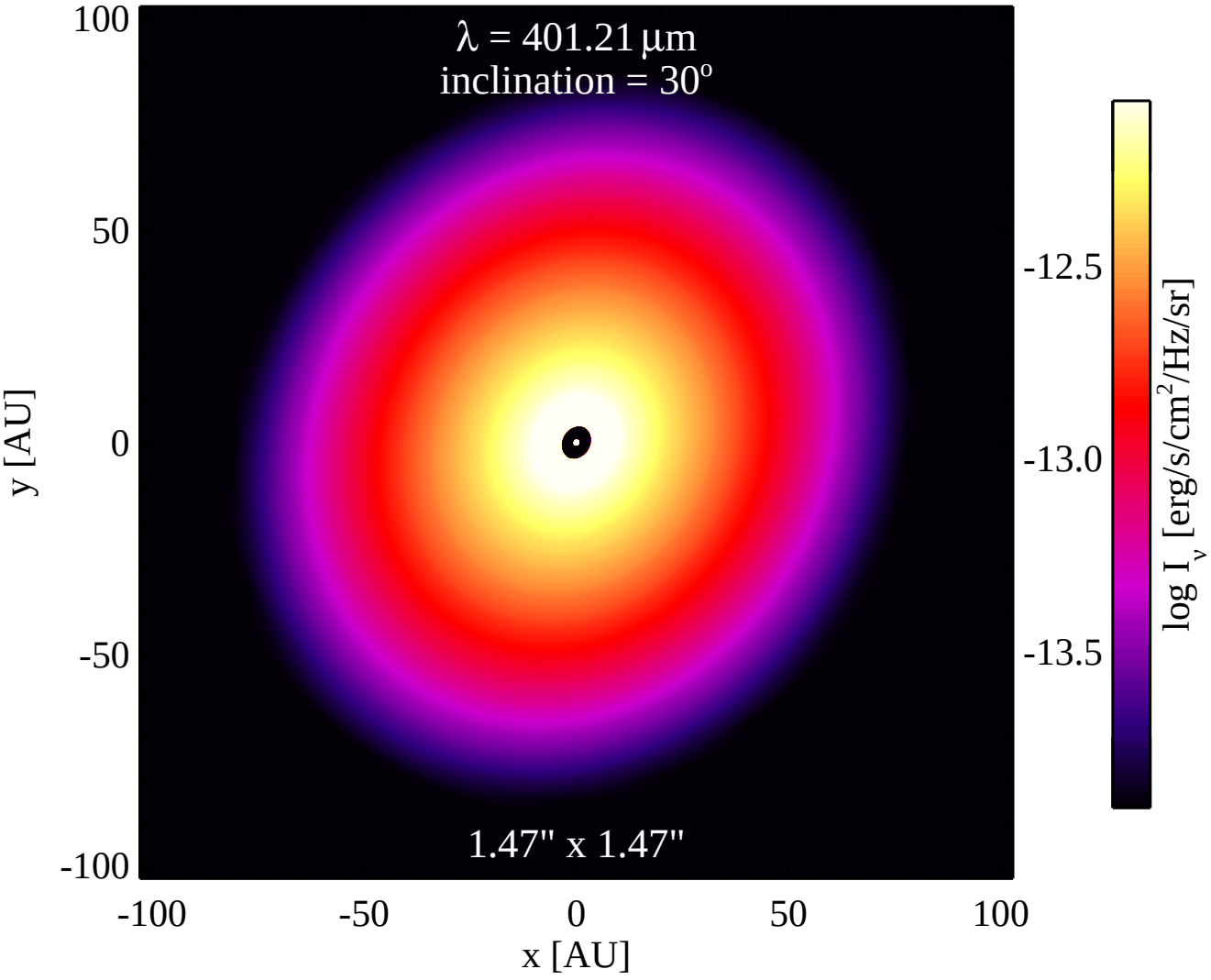

λ = 125.13 μm
inclination = 30°
1.06" x 1.06"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

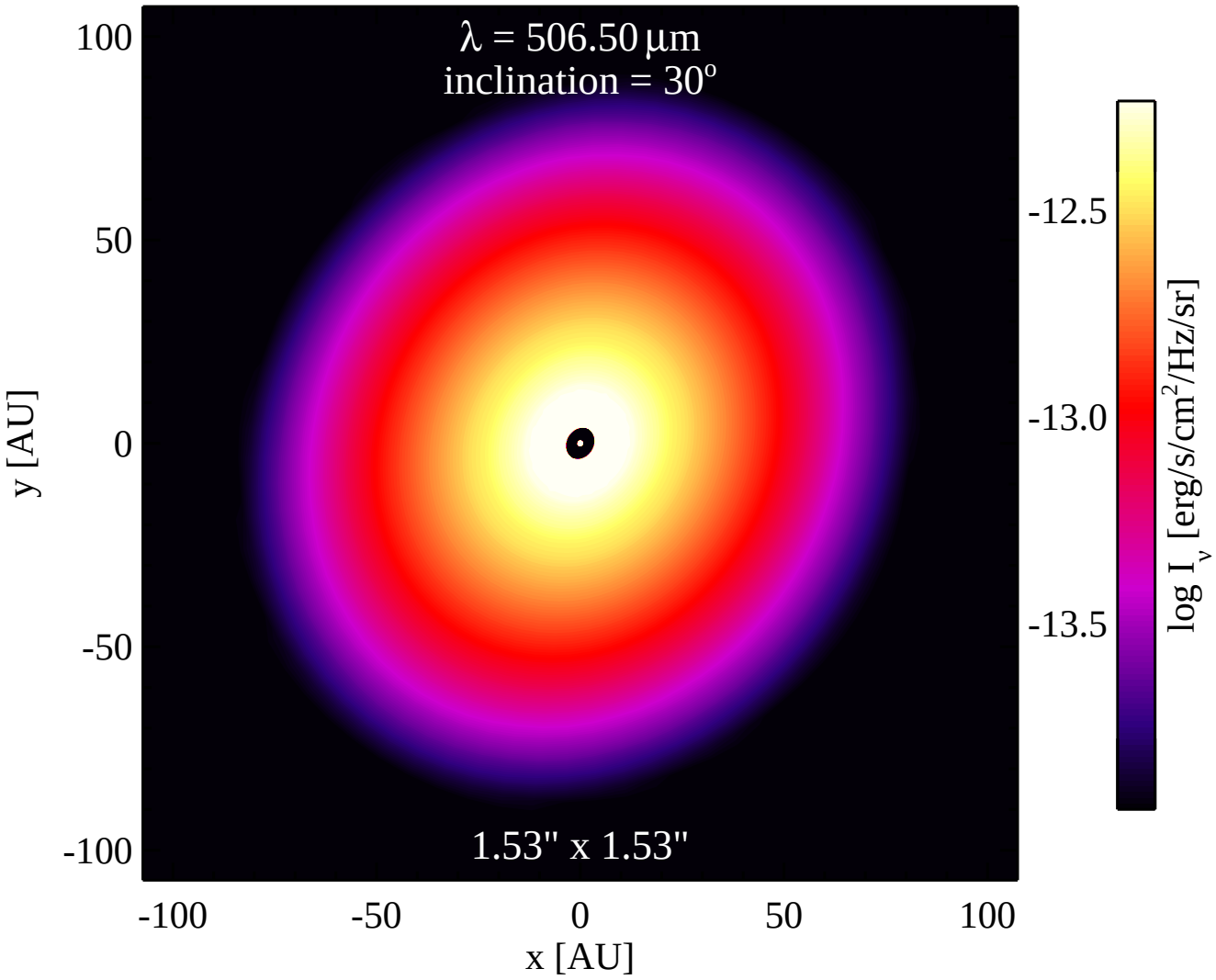

λ = 157.96 μm
inclination = 30°
1.12" x 1.12"
60
40
20
0
-20
-40
-60
y [AU]
-60
-40
-20
0
20
40
60
x [AU]
-11.5
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

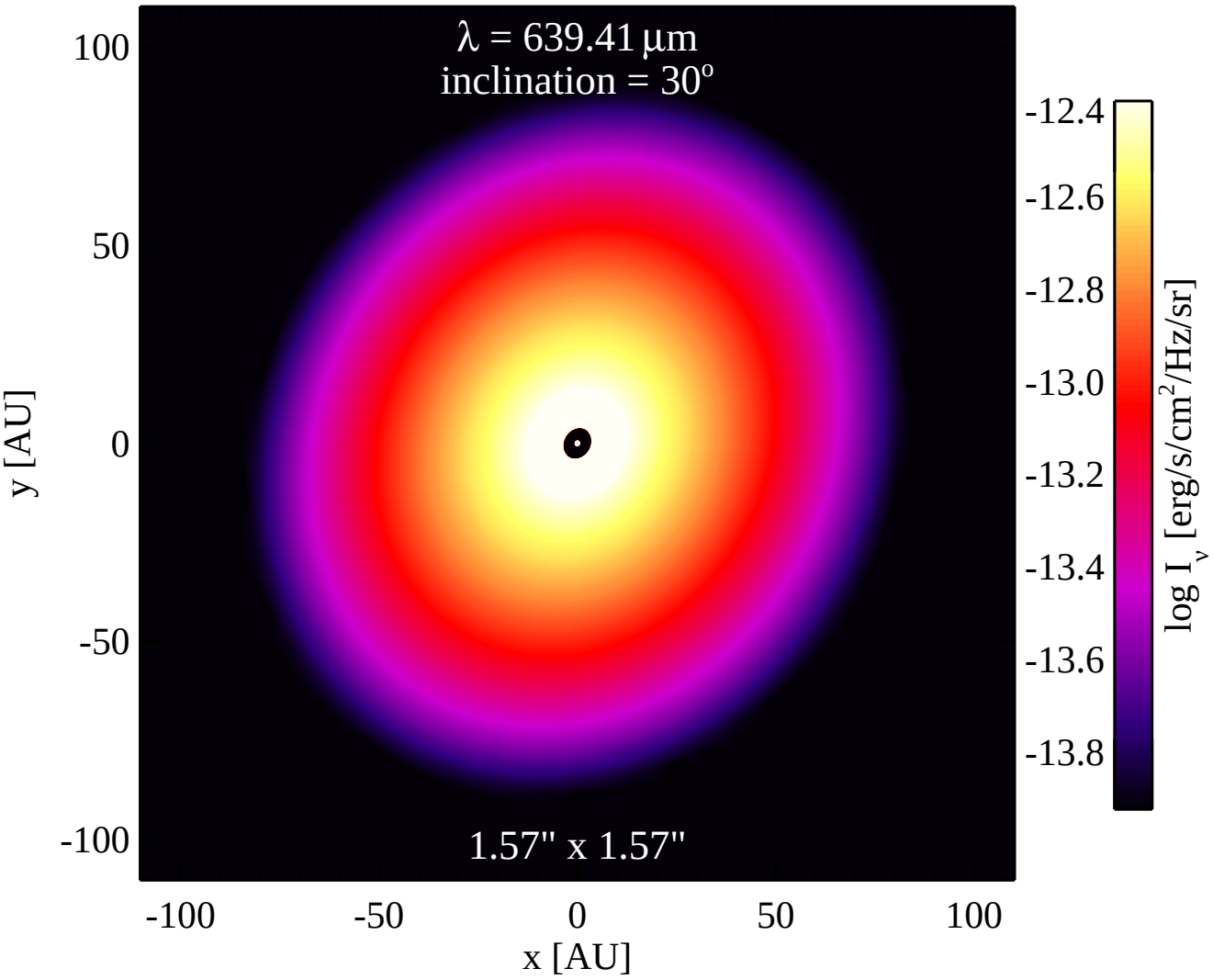

λ = 199.41 μm
inclination = 30°
1.19" x 1.19"
50
0
-50
y [AU]
-50
0
50
x [AU]
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

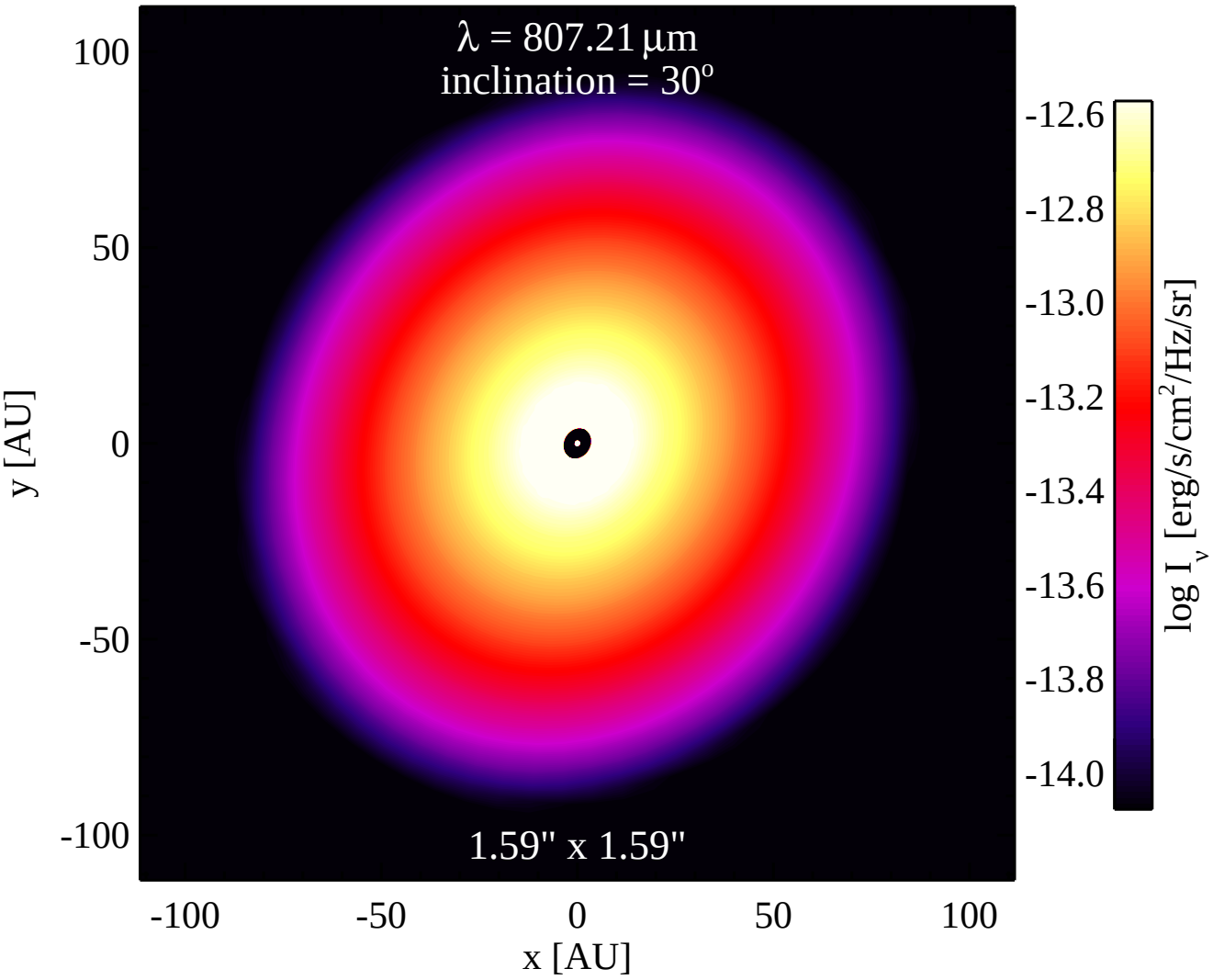

λ = 251.75 μm
inclination = 30°
1.27" x 1.27"
50
0
-50
y [AU]
-50
0
50
x [AU]
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

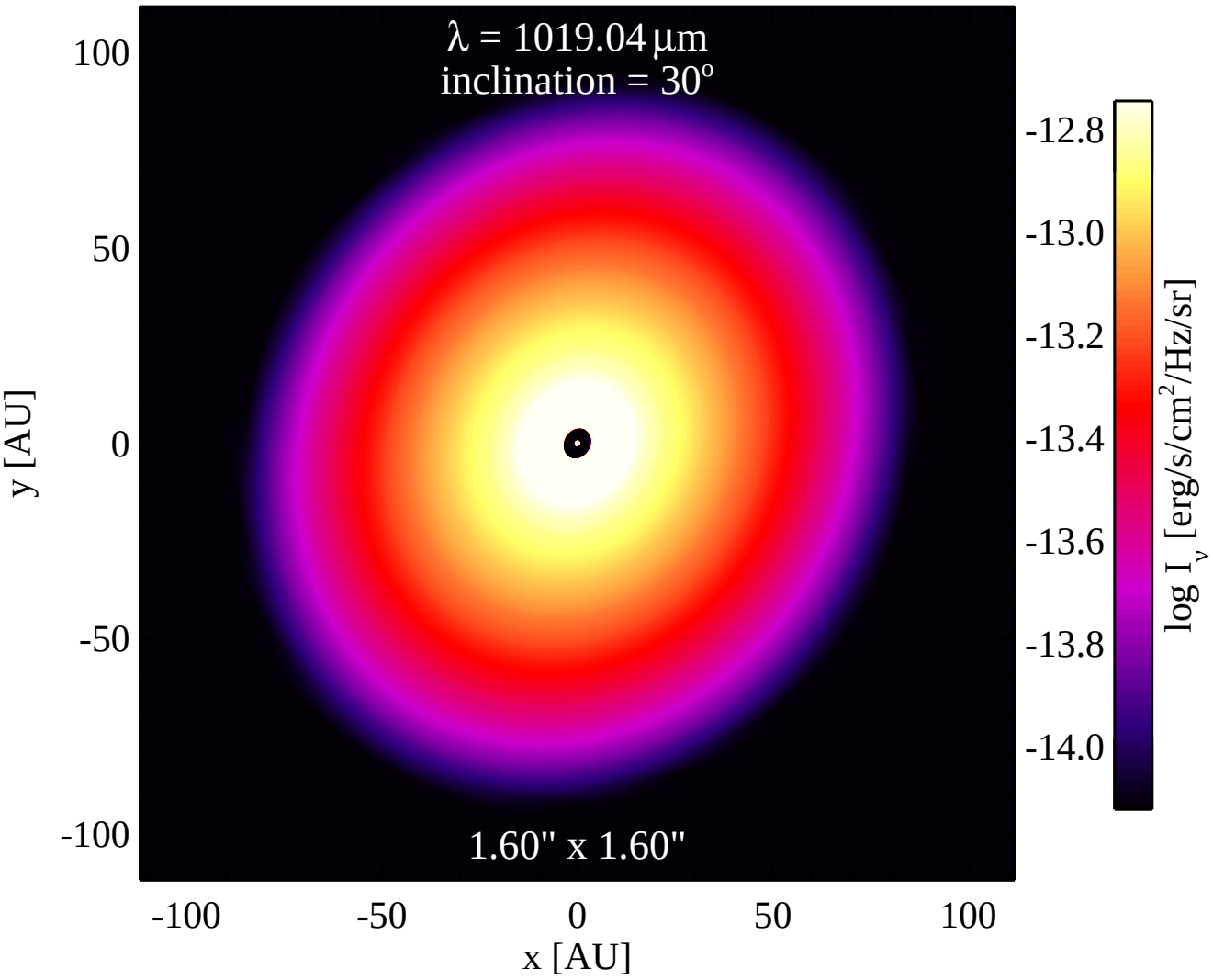

λ = 317.81 μm
inclination = 30°
1.38" x 1.38"
50
0
-50
y [AU]
-50
0
50
x [AU]
-12.0
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

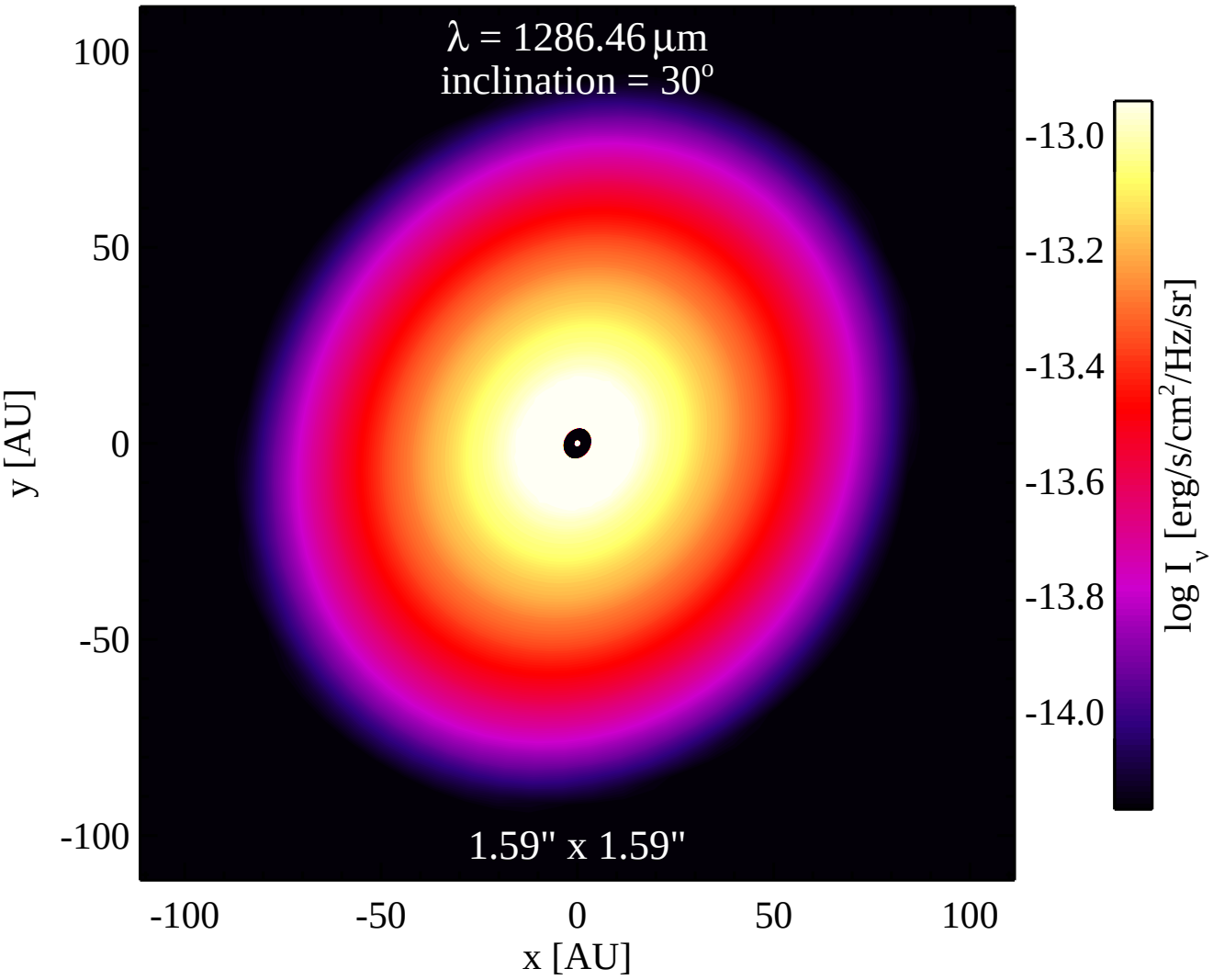

λ = 401.21 μm
inclination = 30°
1.47" x 1.47"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

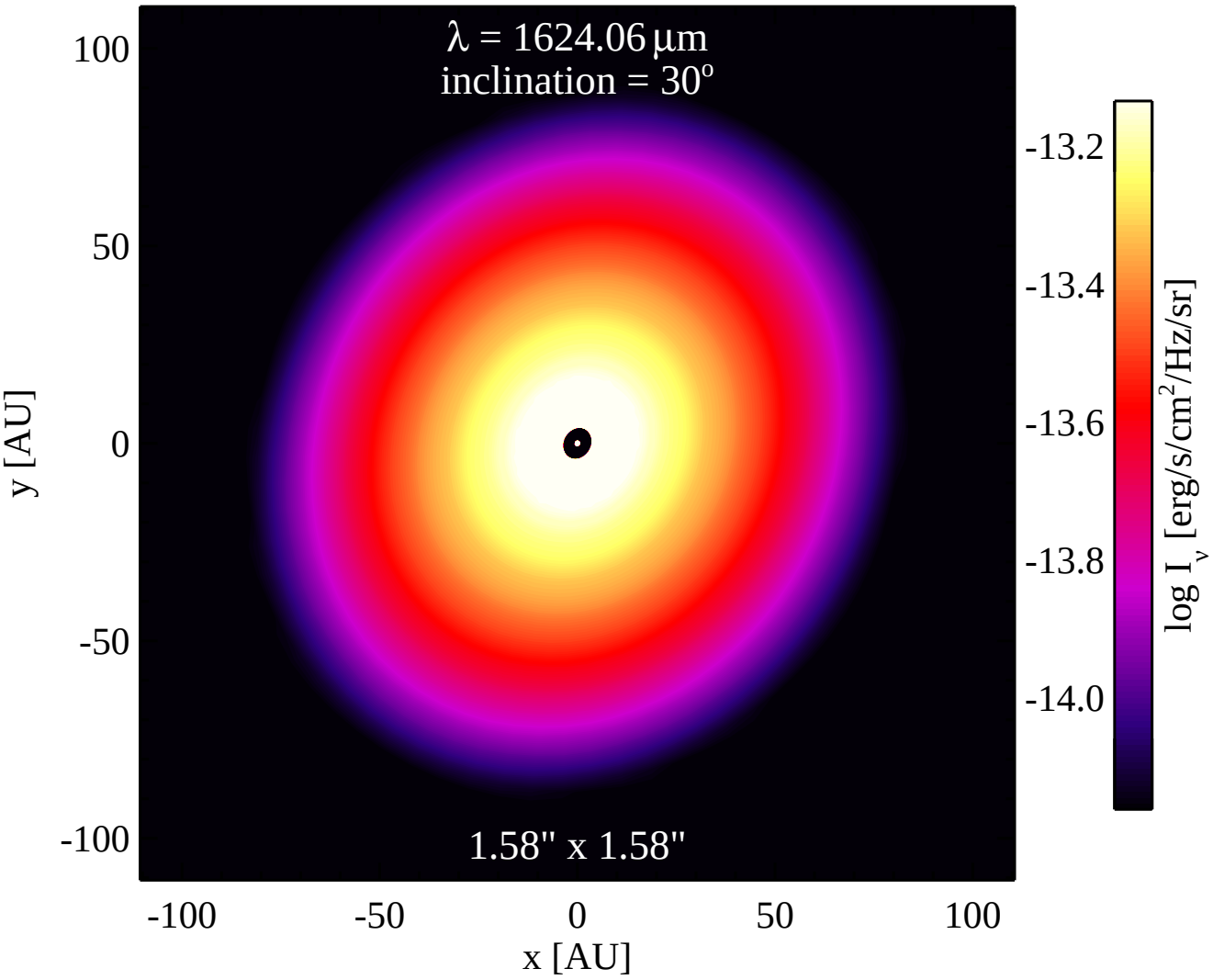

λ = 506.50 μm
inclination = 30°
1.53" x 1.53"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-12.5
-13.0
-13.5
log I_ν [erg/s/cm²/Hz/sr]

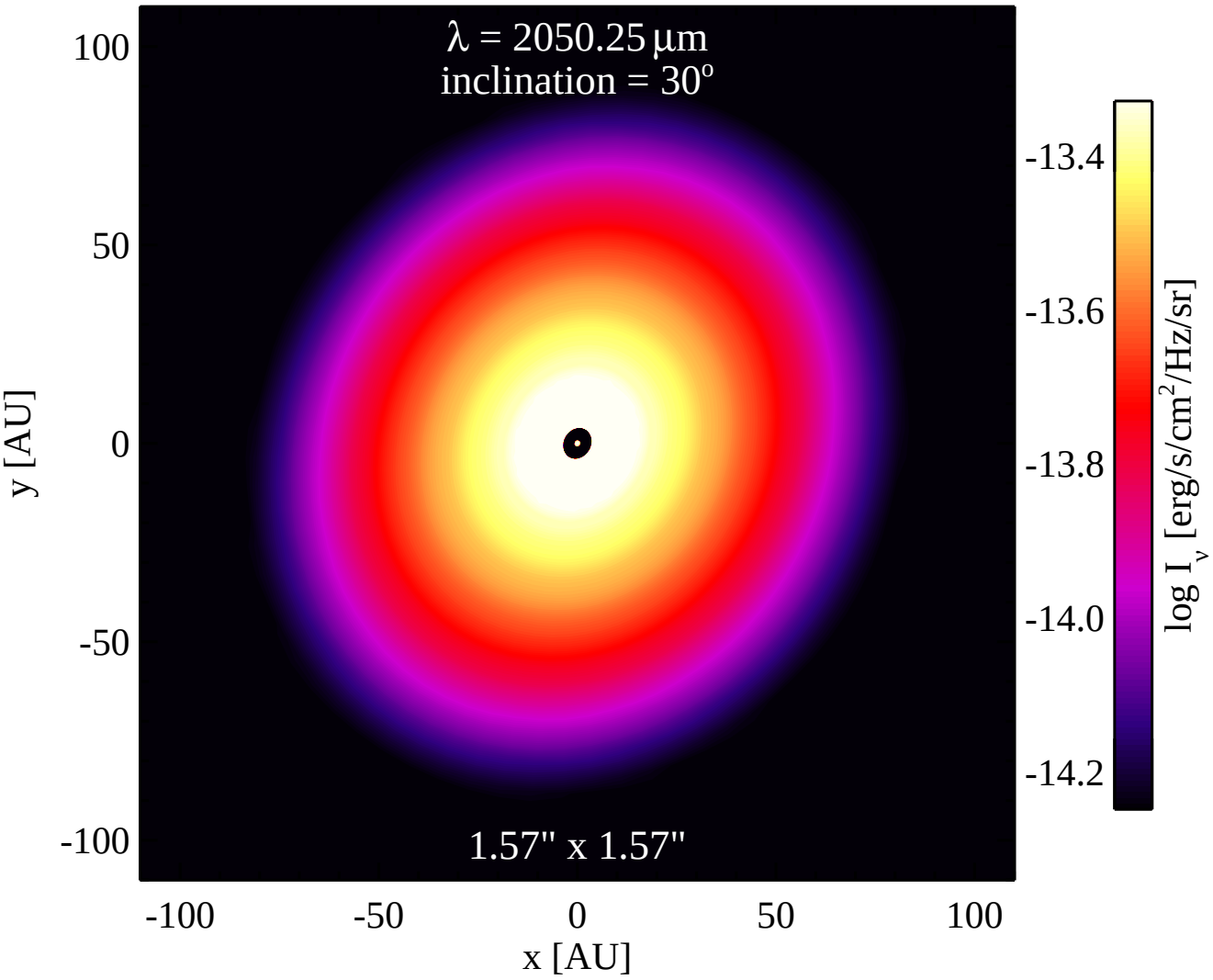

λ = 639.41 μm
inclination = 30°
1.57" x 1.57"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-12.4
-12.6
-12.8
-13.0
-13.2
-13.4
-13.6
-13.8
log I_ν [erg/s/cm²/Hz/sr]

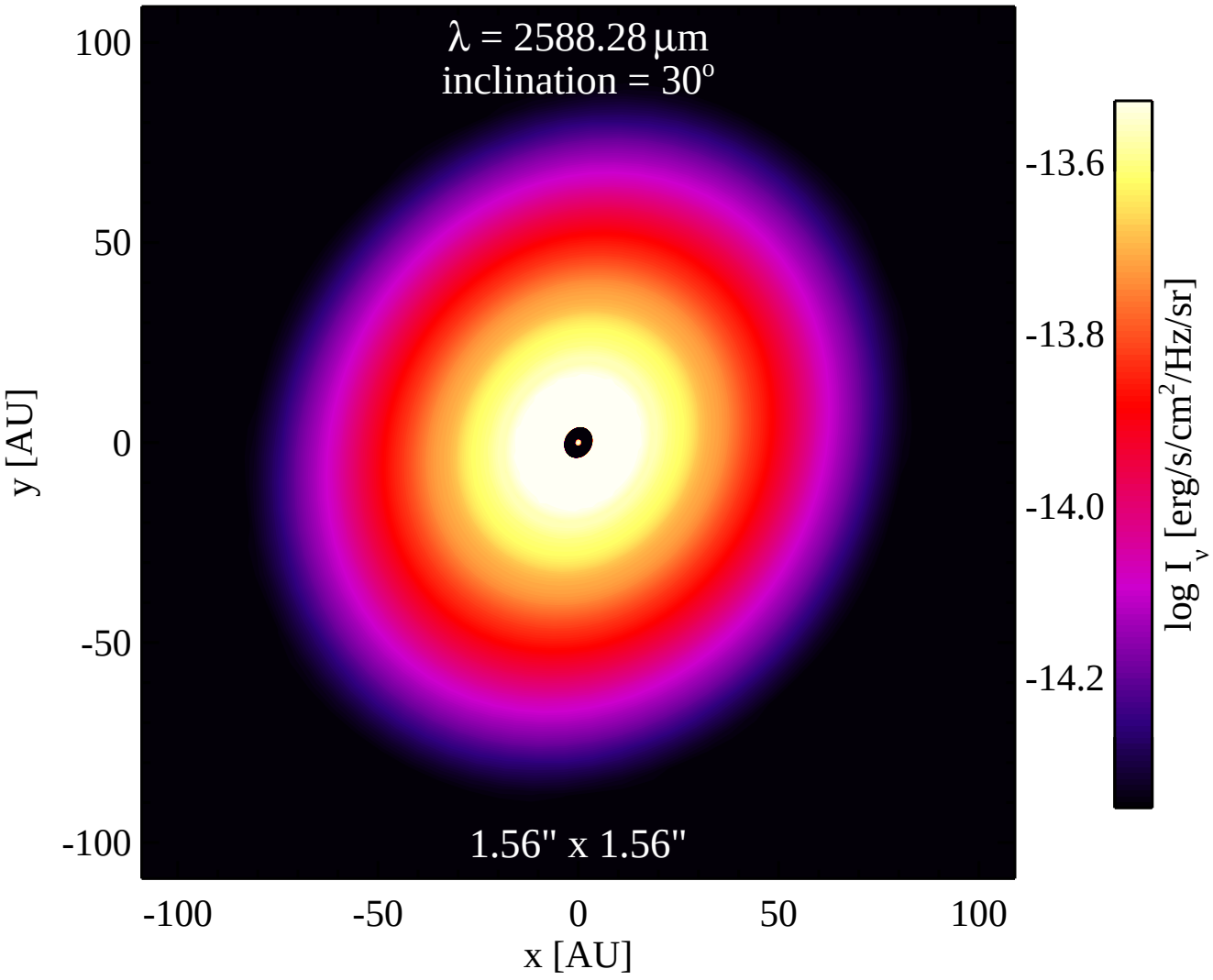

λ = 807.21 μm
inclination = 30°
1.59" x 1.59"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-12.6
-12.8
-13.0
-13.2
-13.4
-13.6
-13.8
-14.0
log I_ν [erg/s/cm²/Hz/sr]

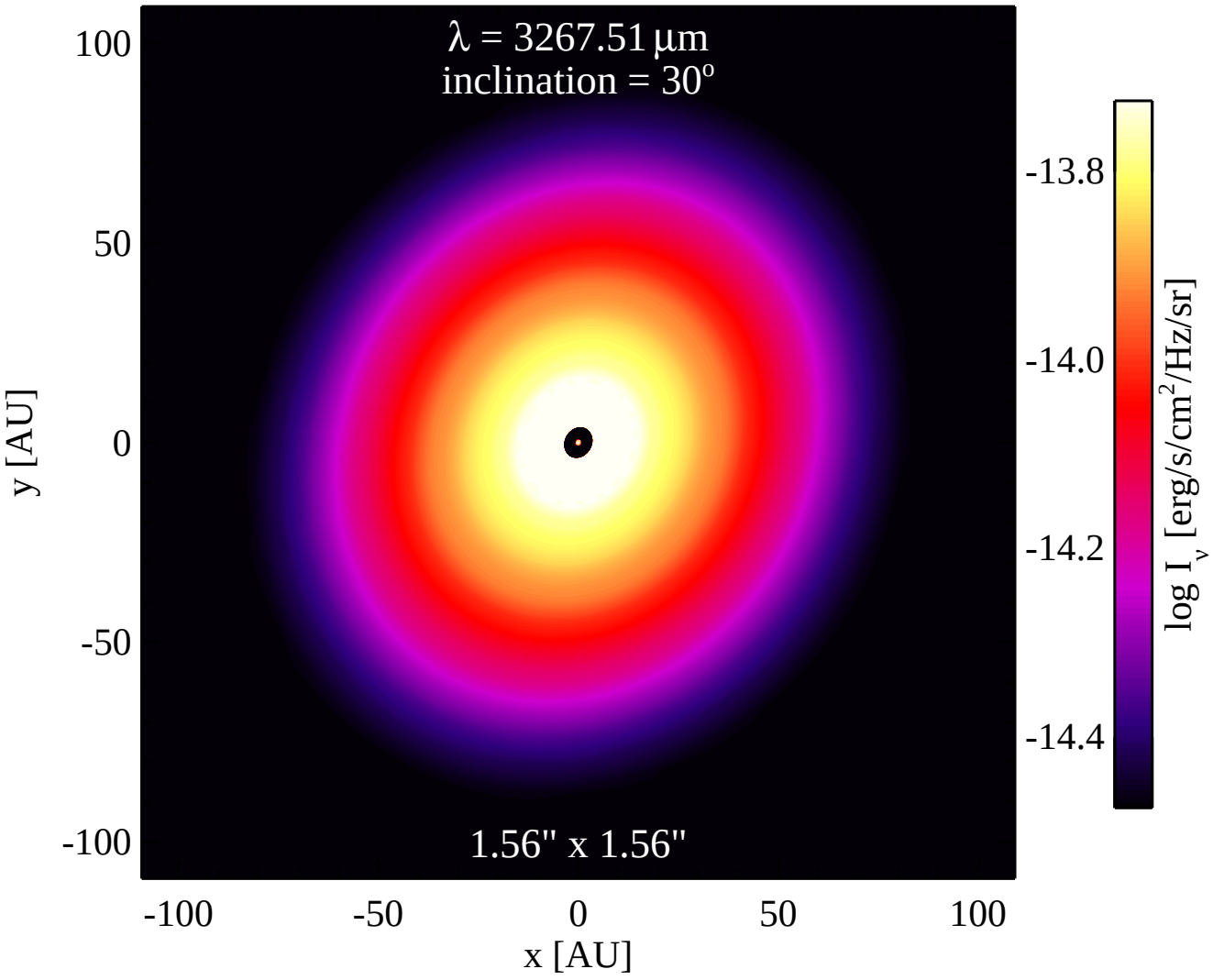

λ = 1019.04 μm
inclination = 30°
1.60" x 1.60"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-12.8
-13.0
-13.2
-13.4
-13.6
-13.8
-14.0
log I_ν [erg/s/cm²/Hz/sr]

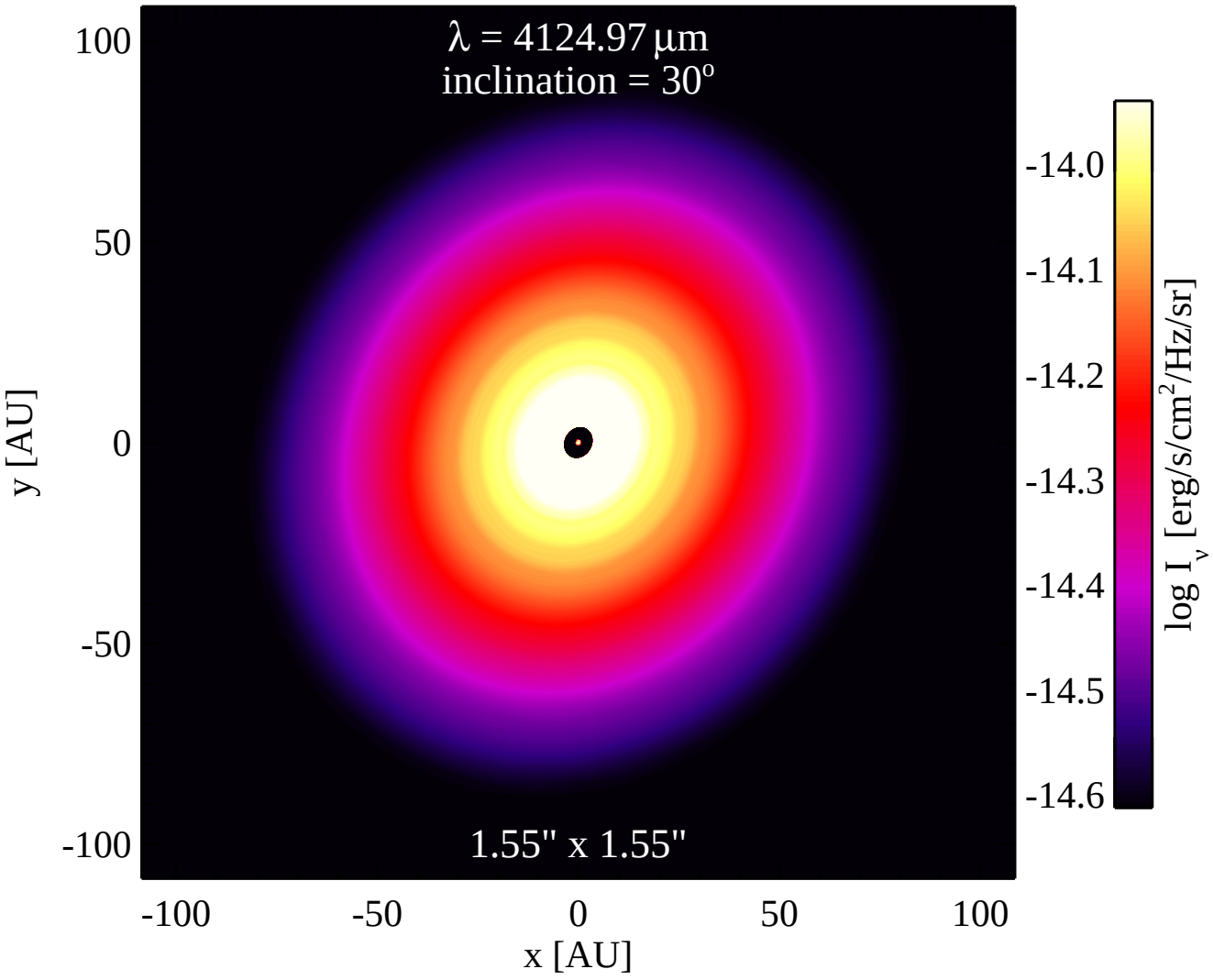

λ = 1286.46 μm
inclination = 30°
1.59" x 1.59"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-13.0
-13.2
-13.4
-13.6
-13.8
-14.0
log I_ν [erg/s/cm²/Hz/sr]

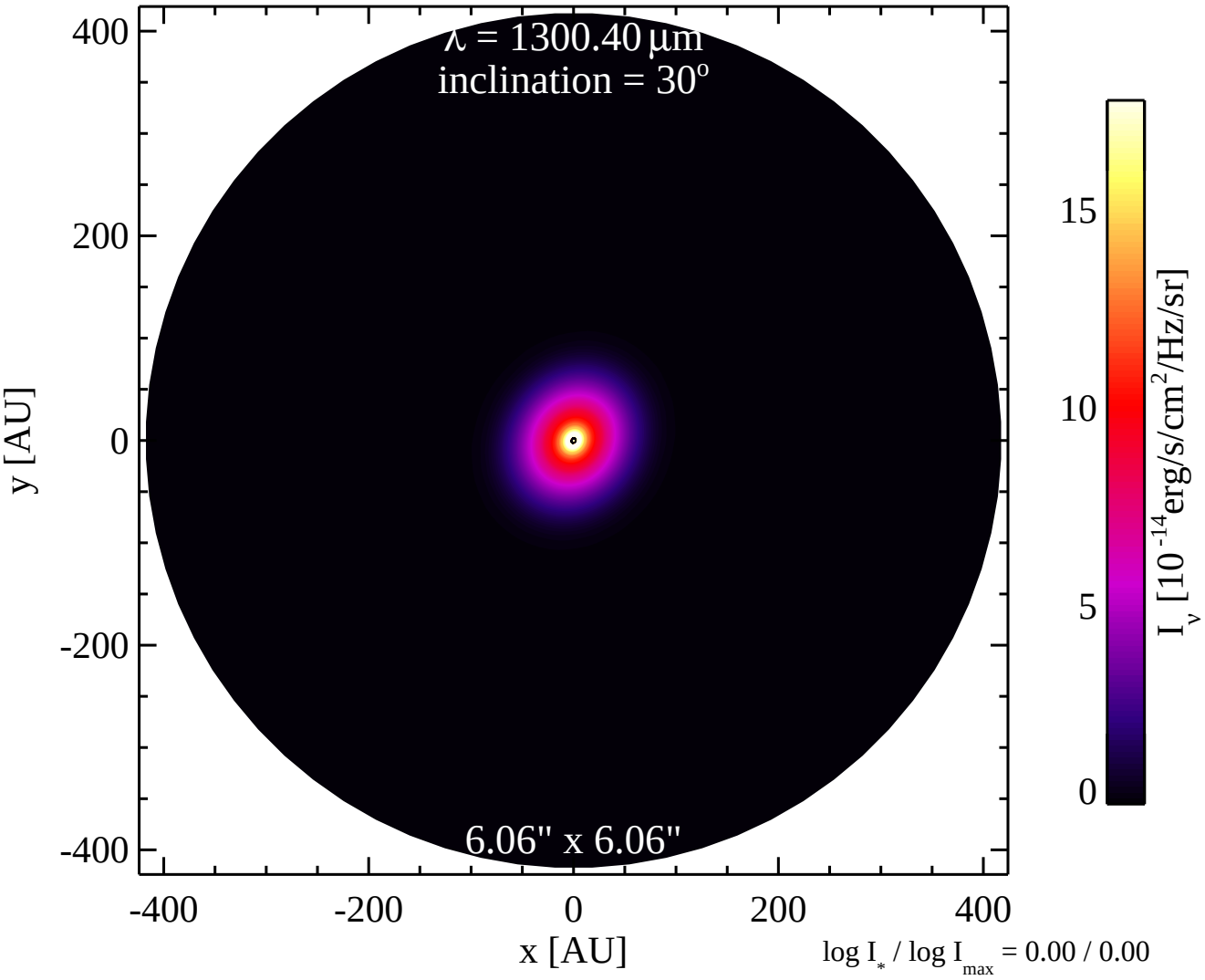

λ = 1624.06 μm
inclination = 30°
1.58" x 1.58"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-13.2
-13.4
-13.6
-13.8
-14.0
log I_ν [erg/s/cm²/Hz/sr]

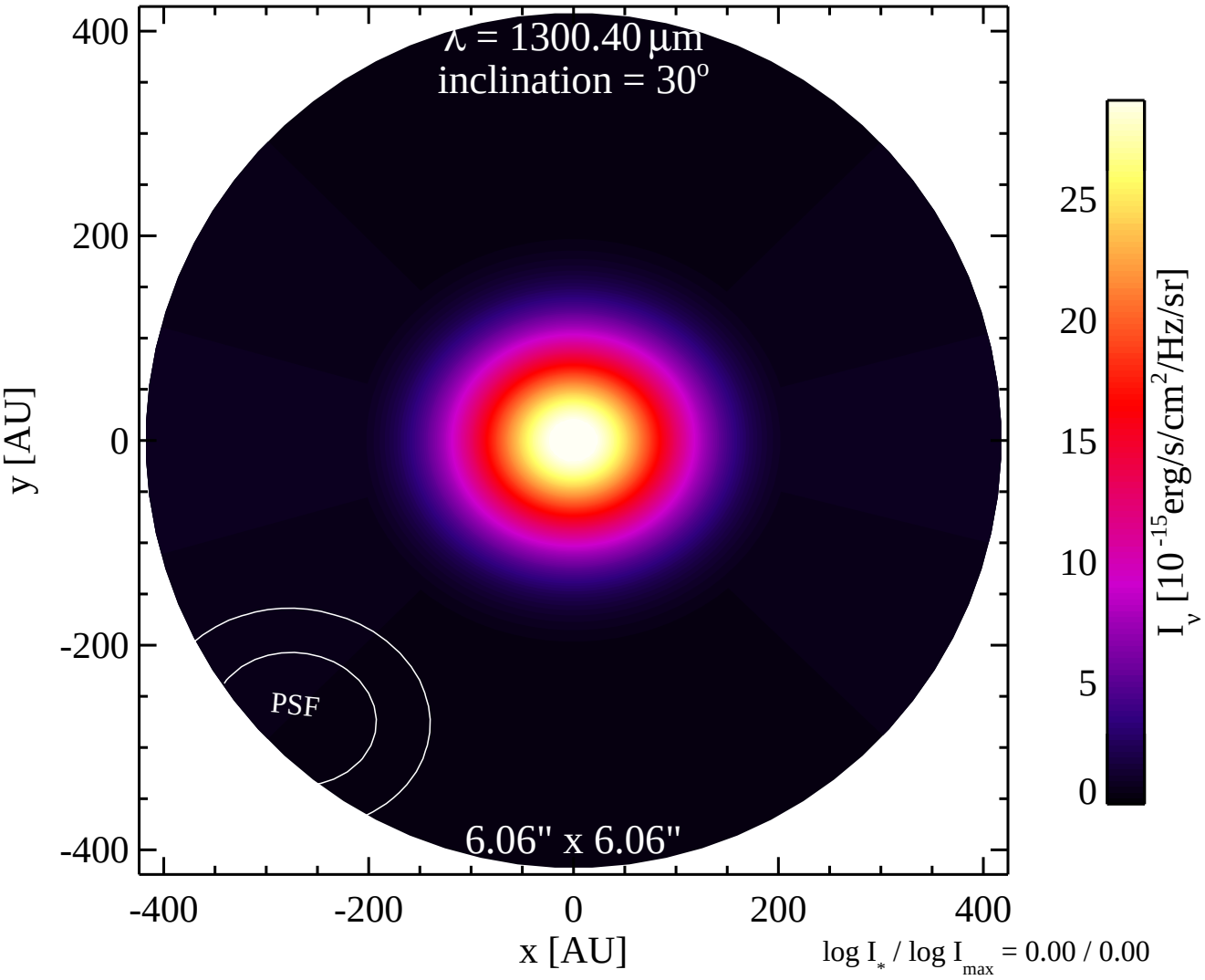

λ = 2050.25 μm
inclination = 30°
1.57" x 1.57"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-13.4
-13.6
-13.8
-14.0
-14.2
log I_ν [erg/s/cm²/Hz/sr]

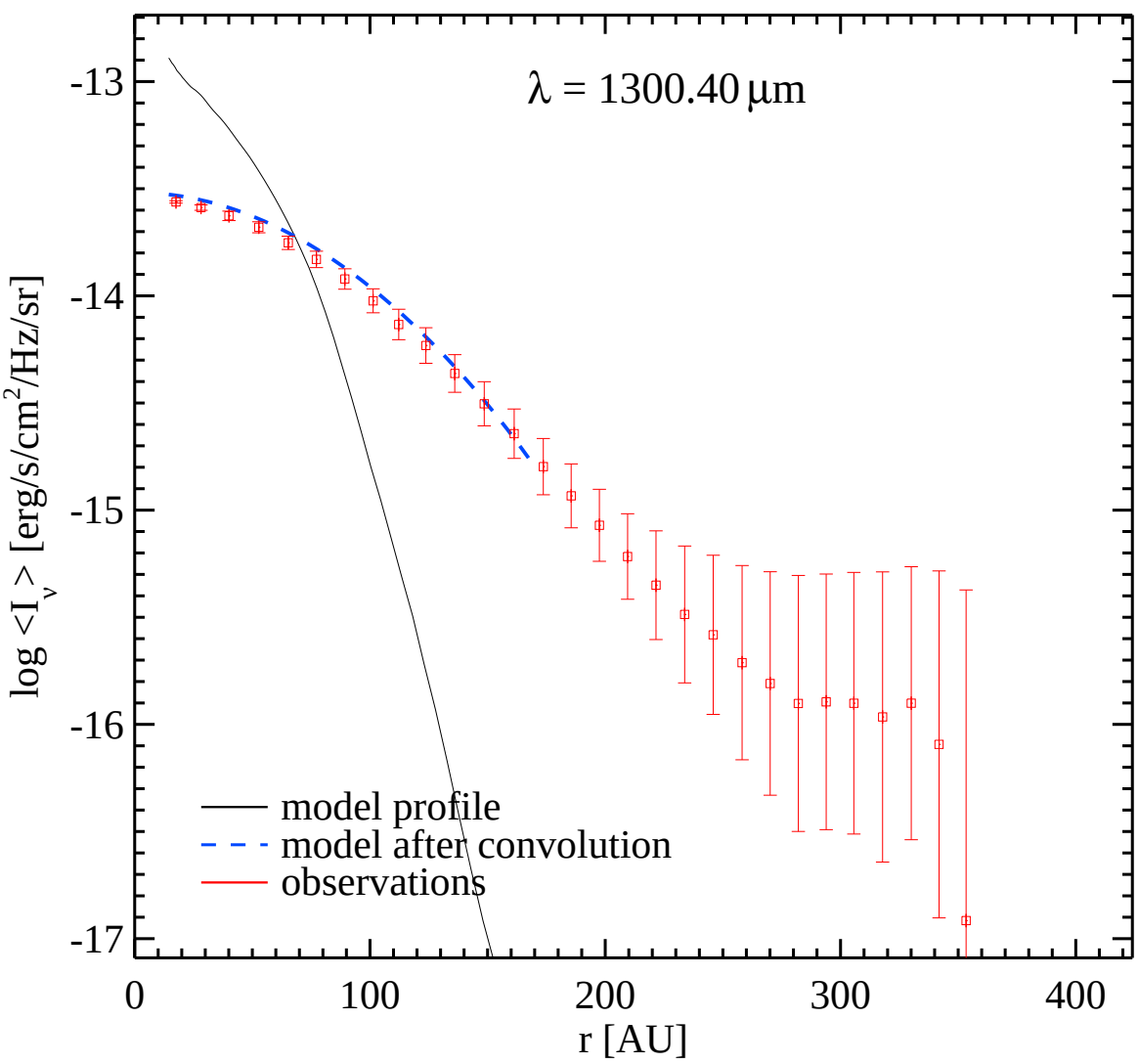

λ = 2588.28 μm
inclination = 30°
1.56" x 1.56"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-13.6
-13.8
-14.0
-14.2
log I_ν [erg/s/cm²/Hz/sr]

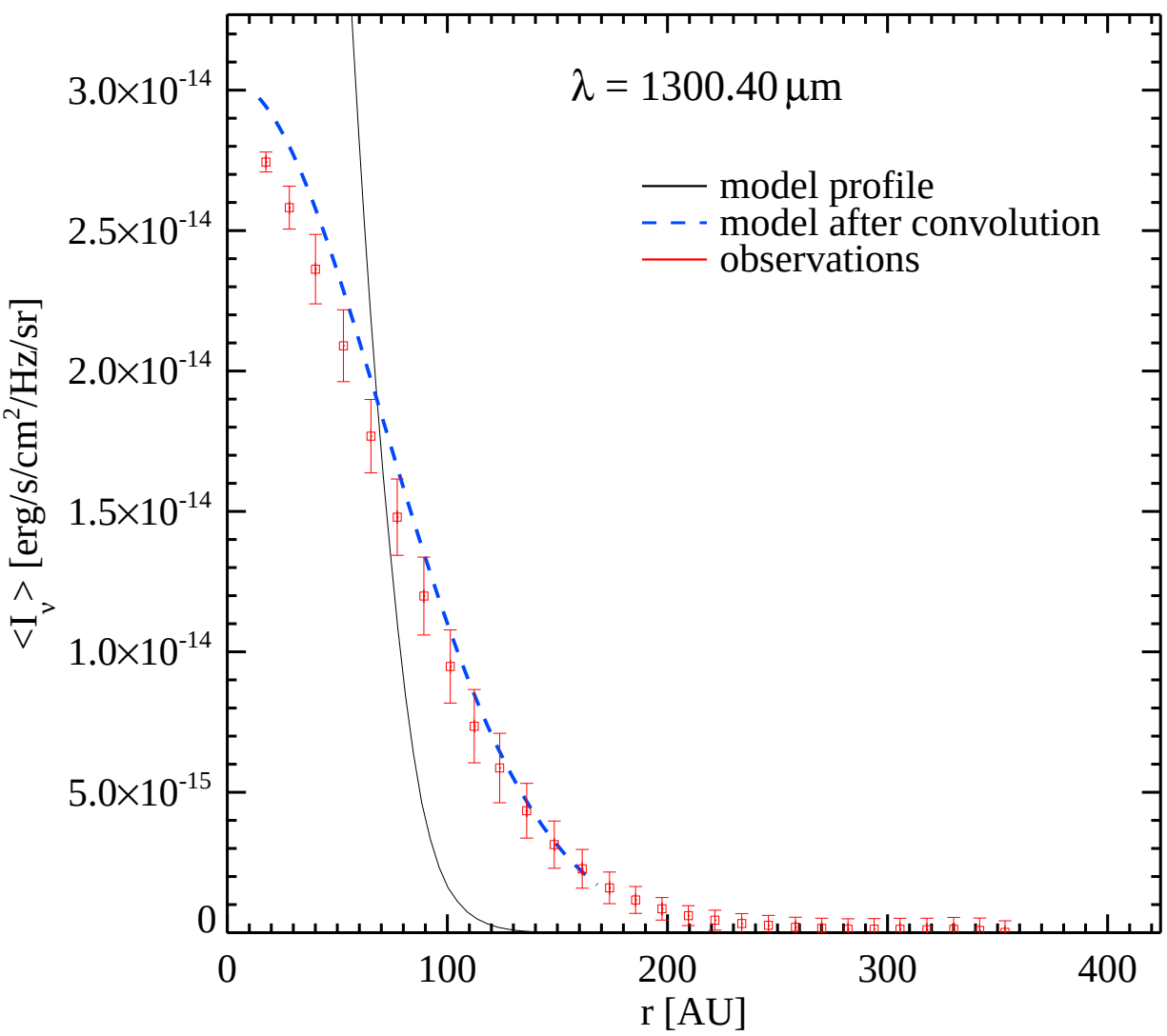

λ = 3267.51 μm
inclination = 30°
1.56" x 1.56"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-13.8
-14.0
-14.2
-14.4
log I_ν [erg/s/cm²/Hz/sr]

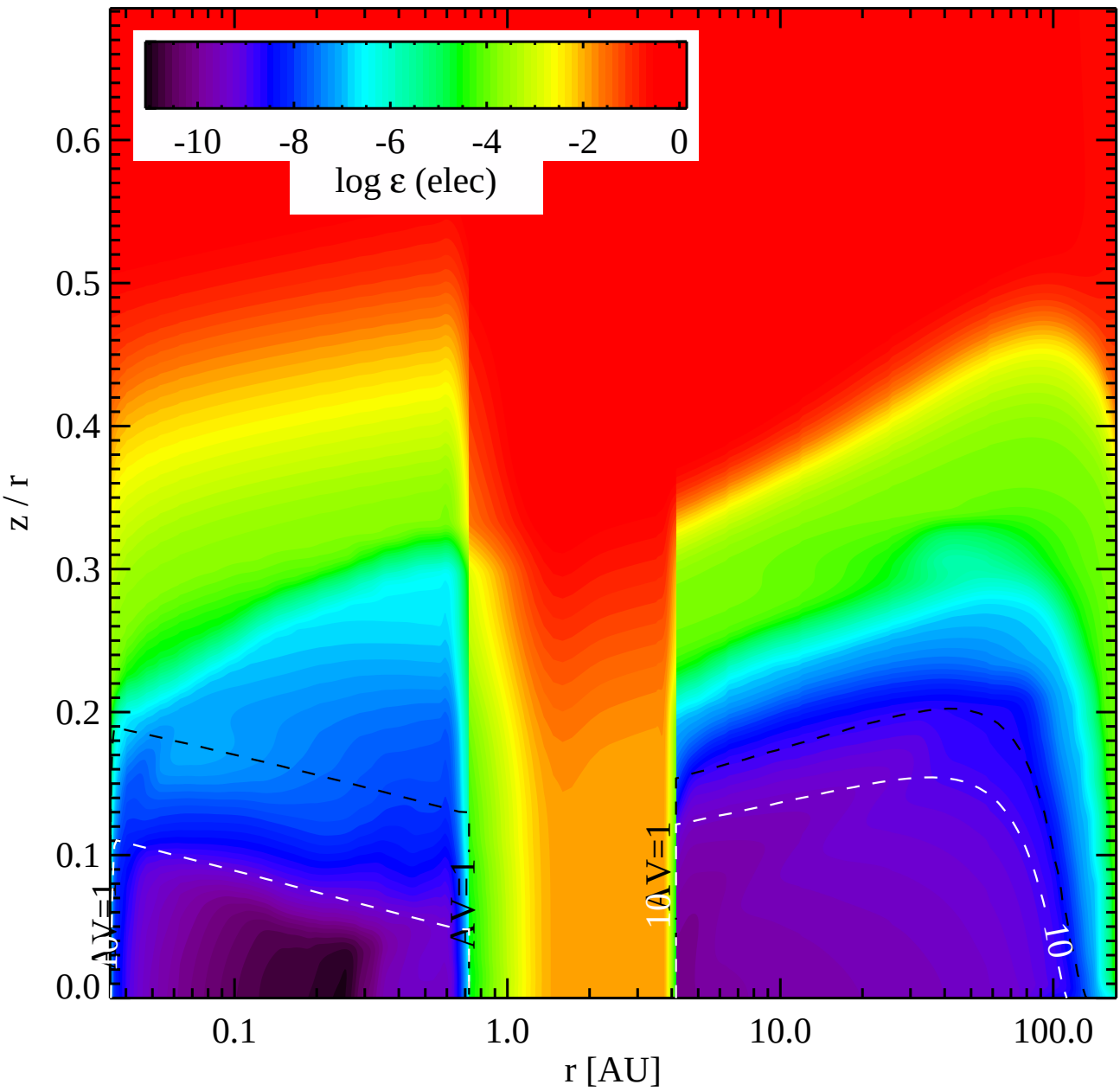

λ = 4124.97 μm
inclination = 30°
1.55" x 1.55"
100
50
0
-50
-100
y [AU]
-100
-50
0
50
100
x [AU]
-14.0
-14.1
-14.2
-14.3
-14.4
-14.5
-14.6
log I_ν [erg/s/cm²/Hz/sr]

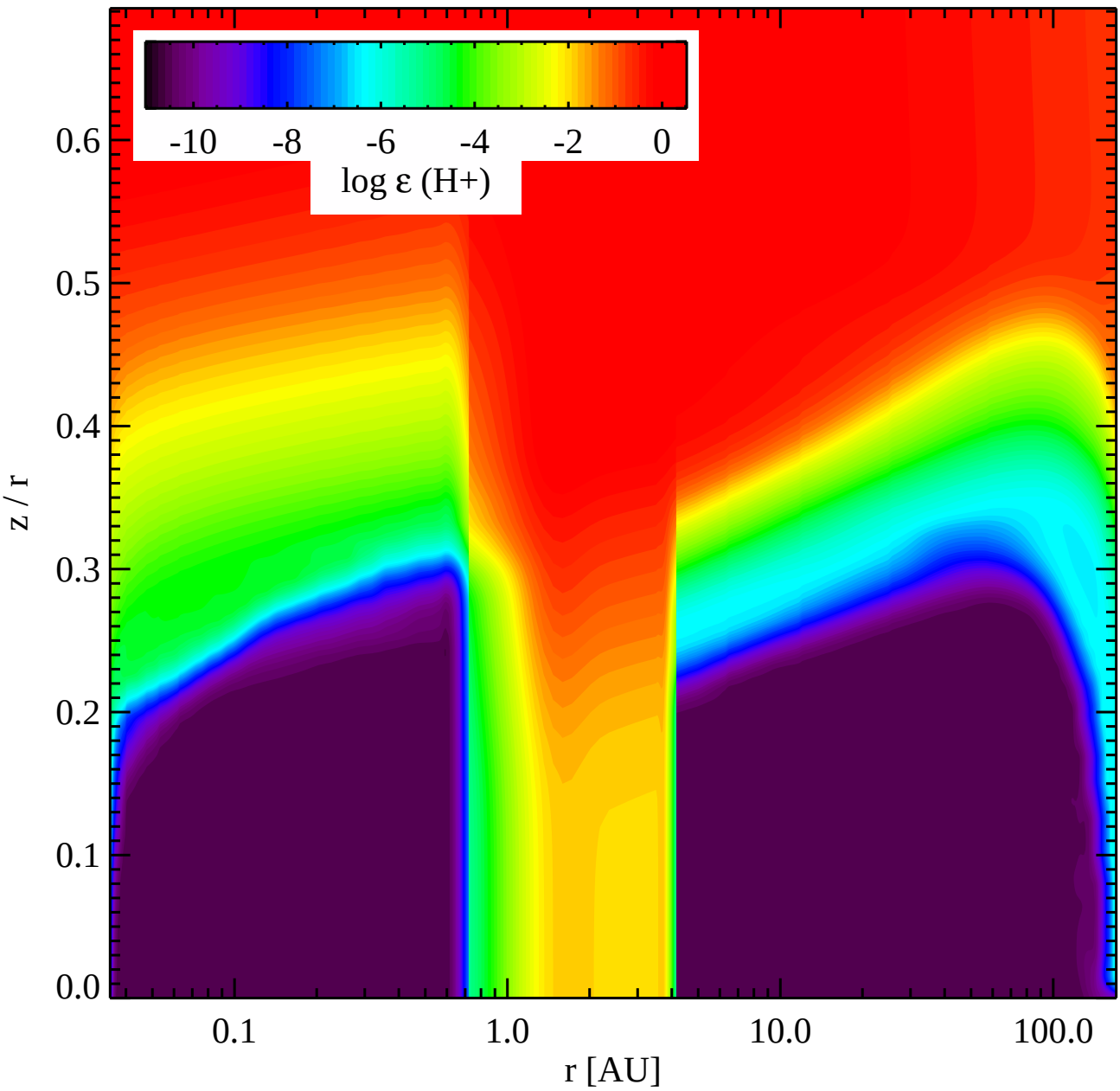

λ = 1300.40 μm
inclination = 30°
6.06" x 6.06"
400
200
0
-200
-400
y [AU]
-400
-200
0
200
400
x [AU]
15
10
5
0
I_ν [10^-14 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

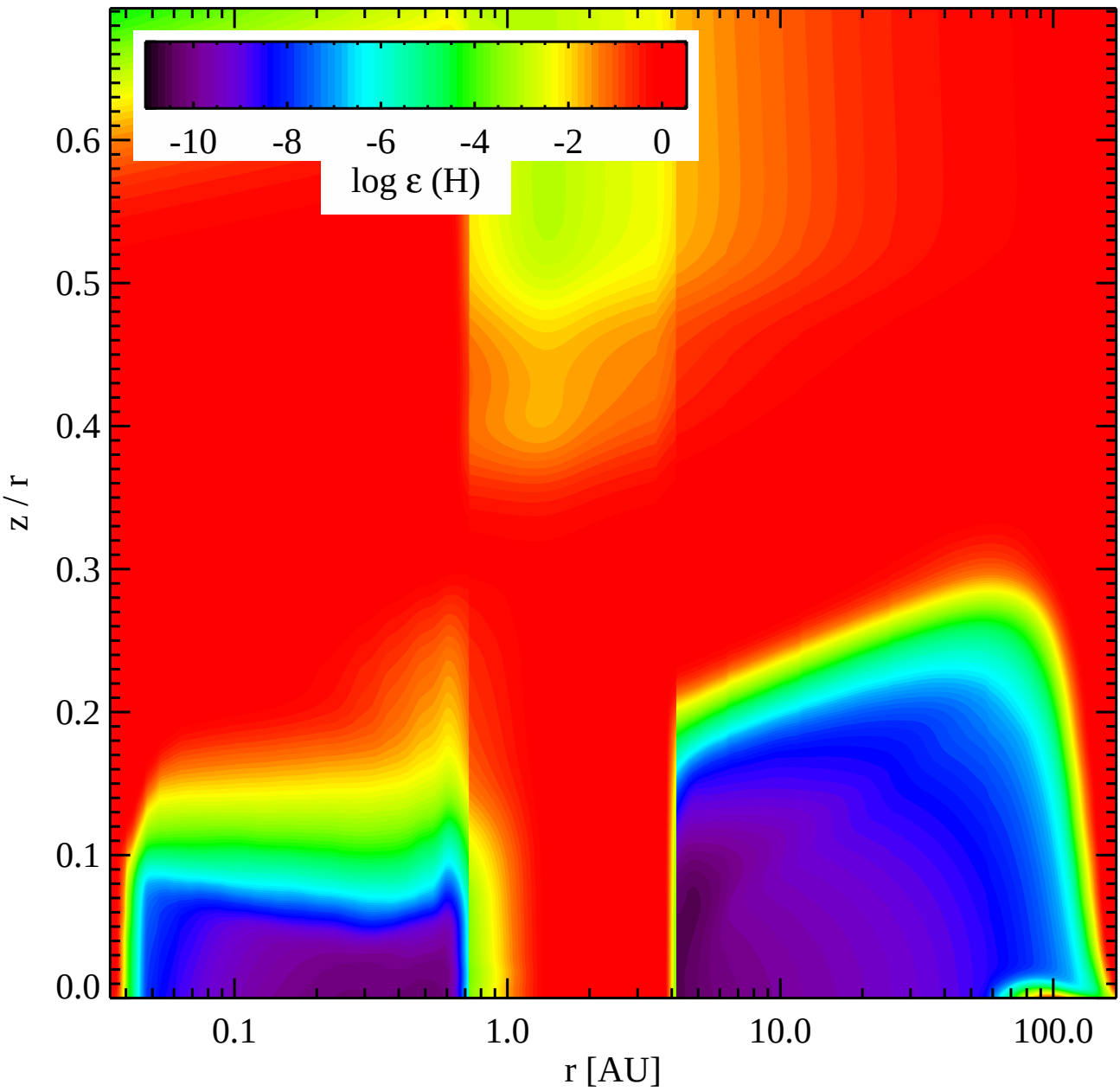

λ = 1300.40 μm
inclination = 30°
PSF
6.06" x 6.06"
400
200
0
-200
-400
y [AU]
-400
-200
0
200
400
x [AU]
25
20
15
10
5
0
I_ν [10^-15 erg/s/cm^2/Hz/sr]
log I_* / log I_max = 0.00 / 0.00

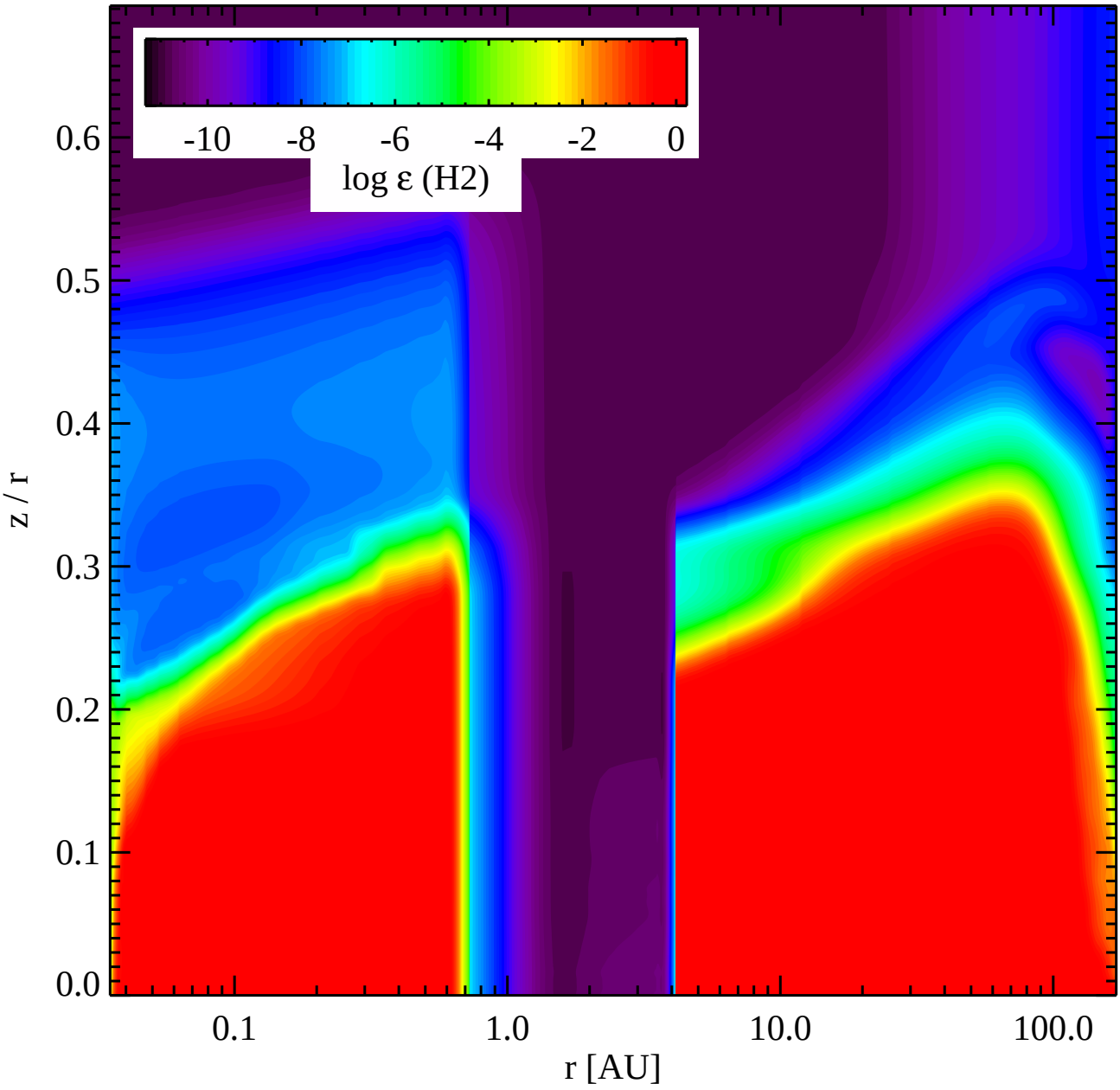

λ = 1300.40 μm
-13
-14
-15
-16
-17
0
100
200
300
400
r [AU]
log <I_ν> [erg/s/cm²/Hz/sr]
model profile
model after convolution
observations

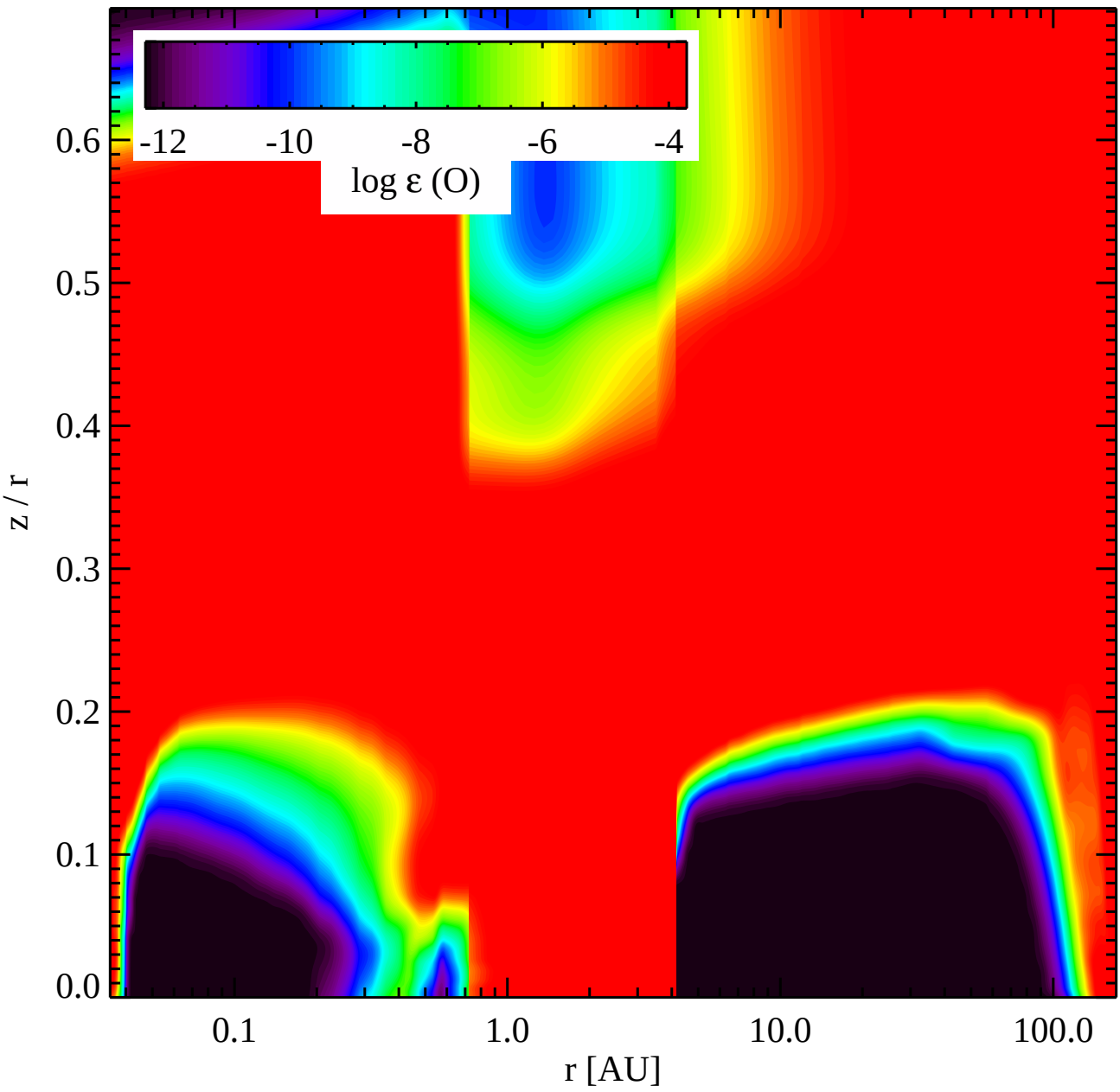

λ = 1300.40 μm
model profile
model after convolution
observations
3.0×10-14
2.5×10-14
2.0×10-14
1.5×10-14
1.0×10-14
5.0×10-15
0
0
100
200
300
400
r [AU]
<Iν> [erg/s/cm2/Hz/sr]

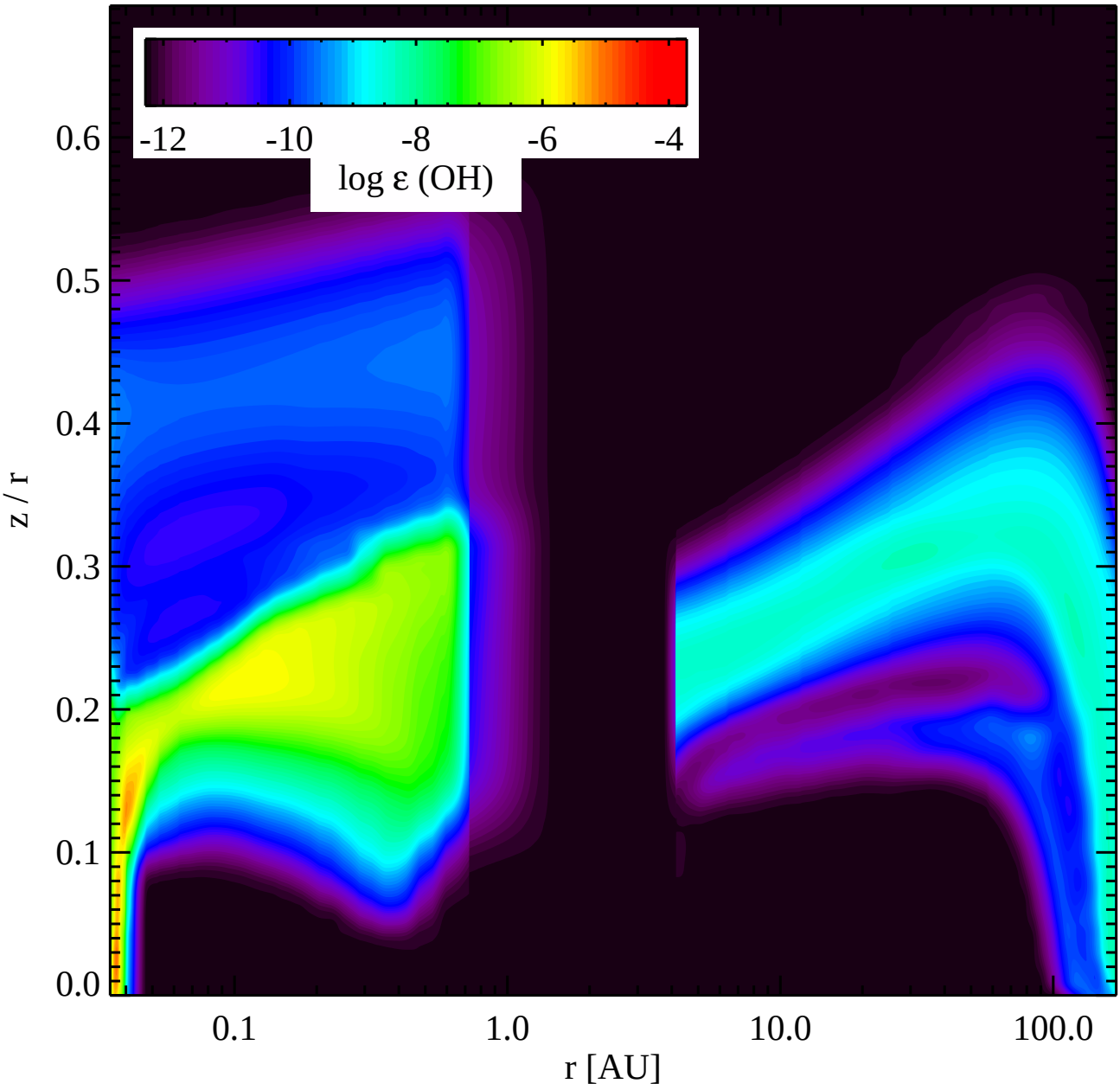

-10
-8
-6
-4
-2
0
log ε (elec)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]
AV=1
AV=1
AV=1
10
10

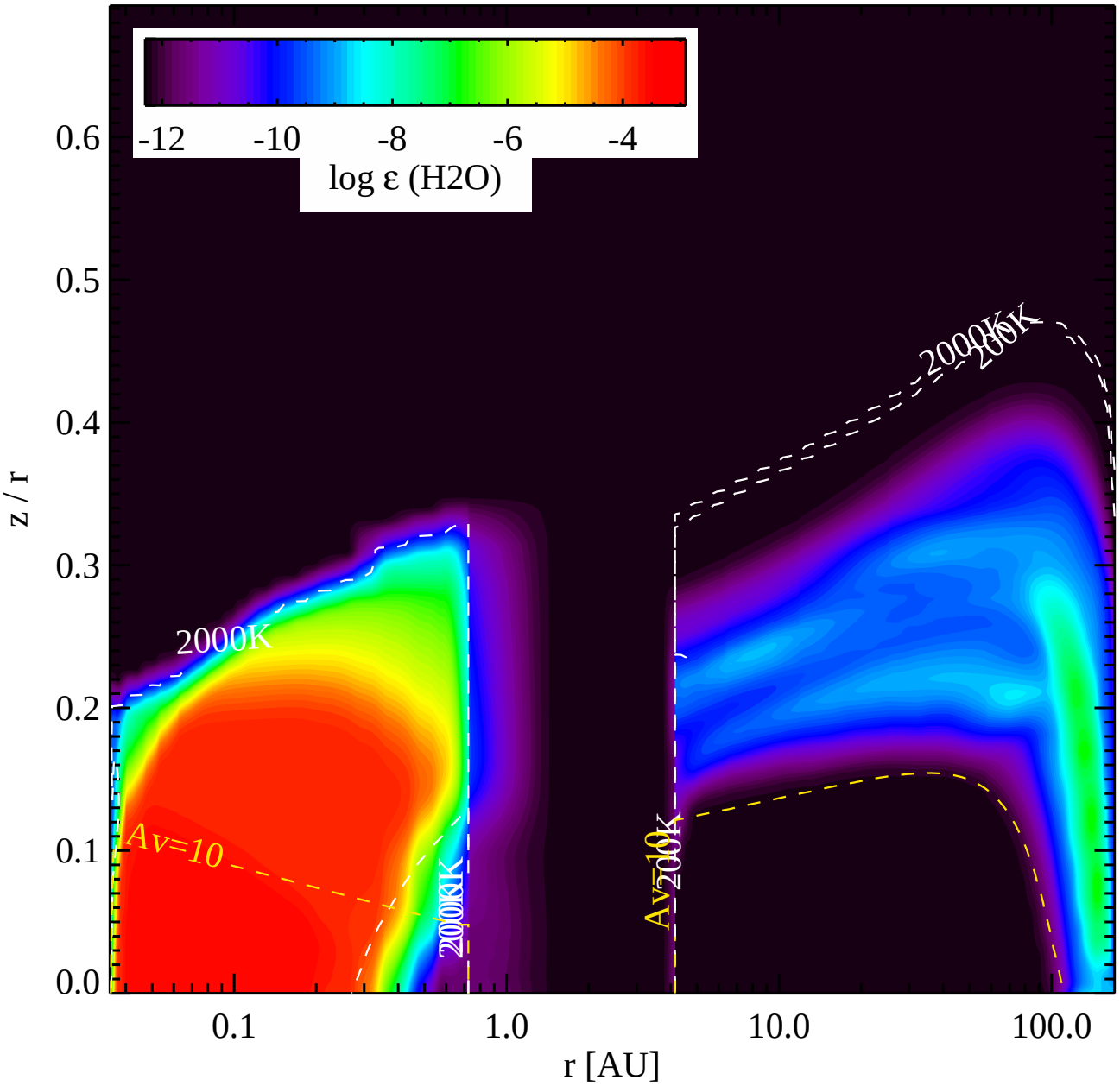

-10
-8
-6
-4
-2
0
log ε (H+)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

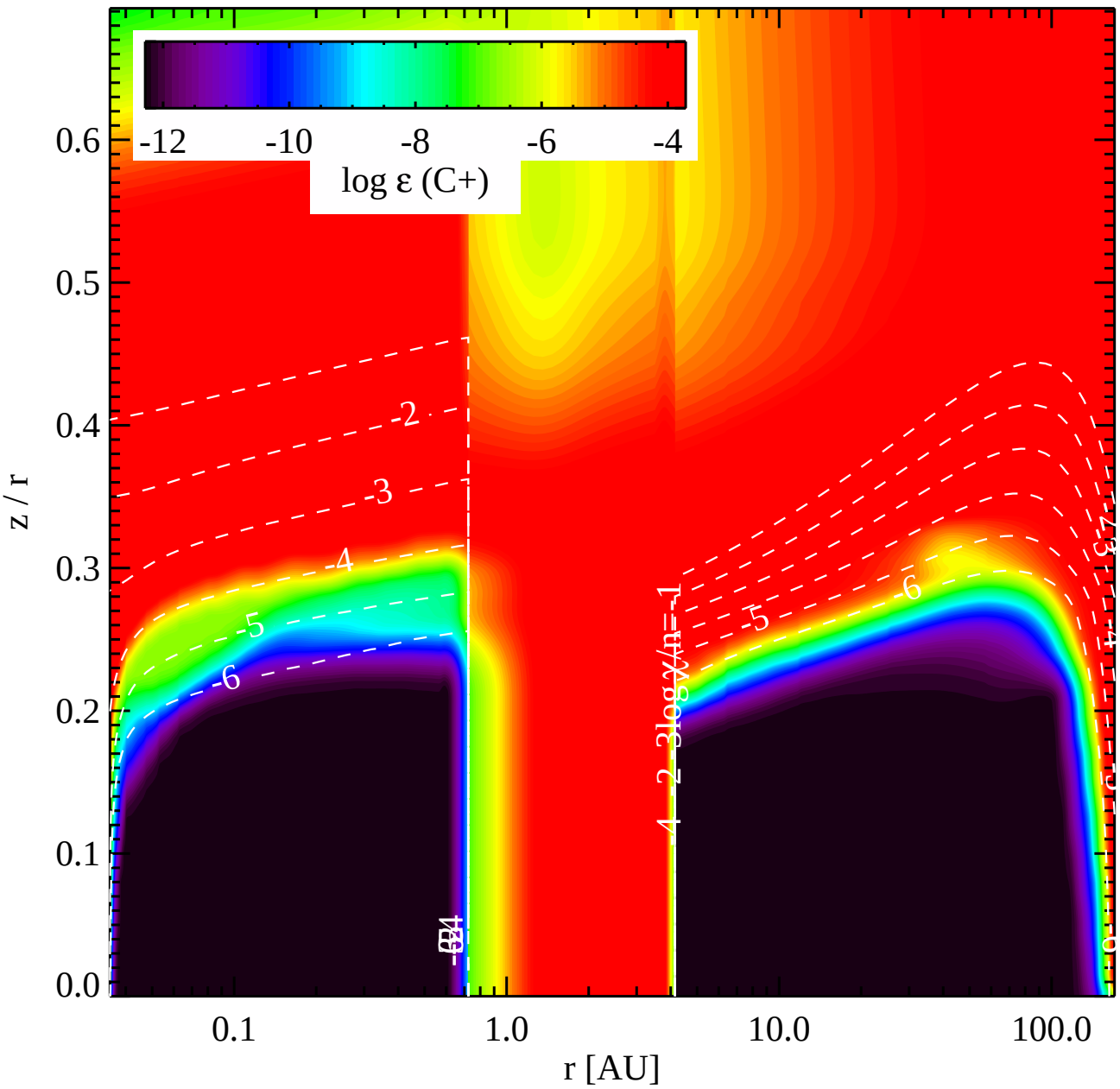

-10
-8
-6
-4
-2
0
log ε (H)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

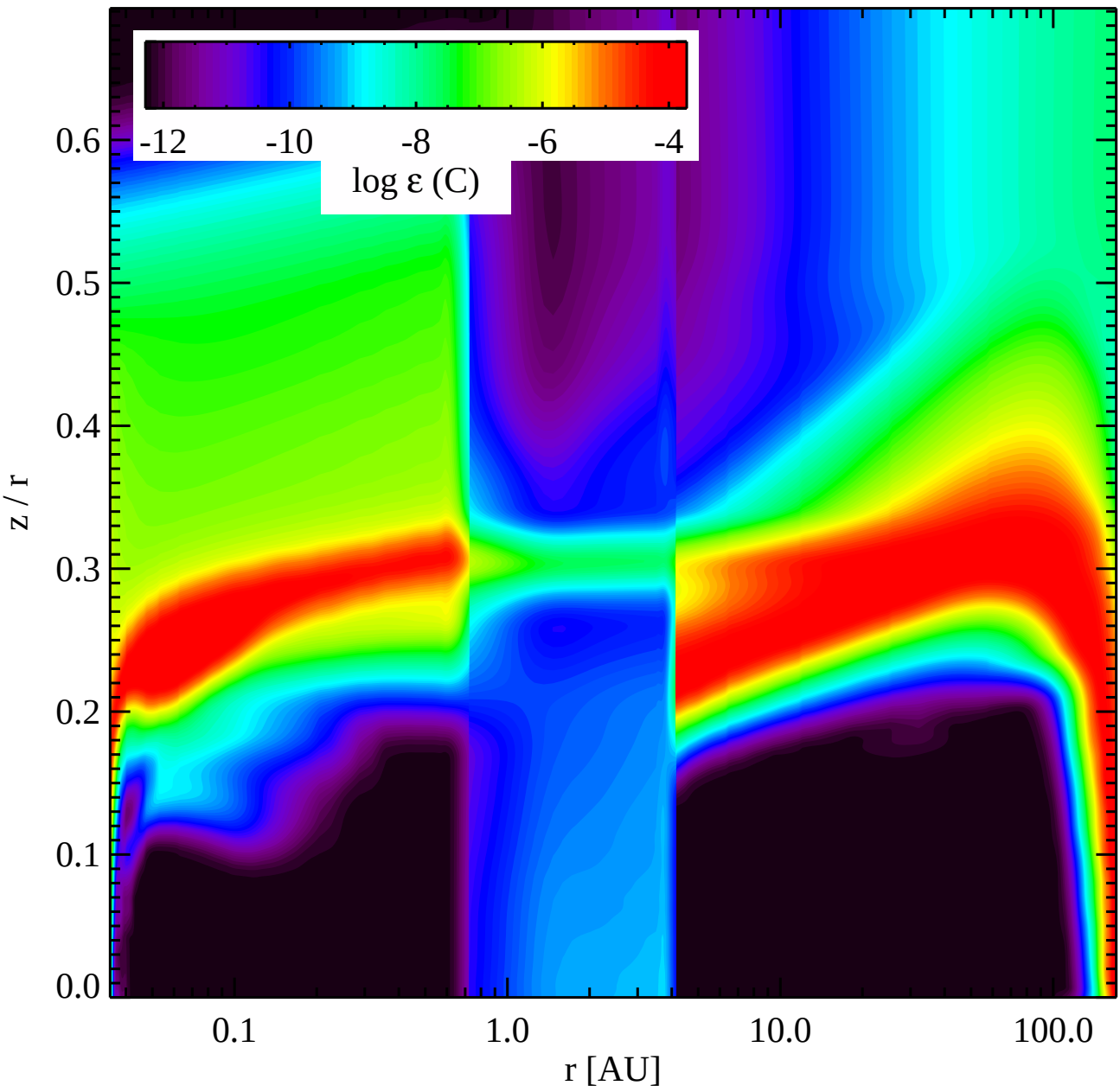

-10
-8
-6
-4
-2
0
log ε (H2)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

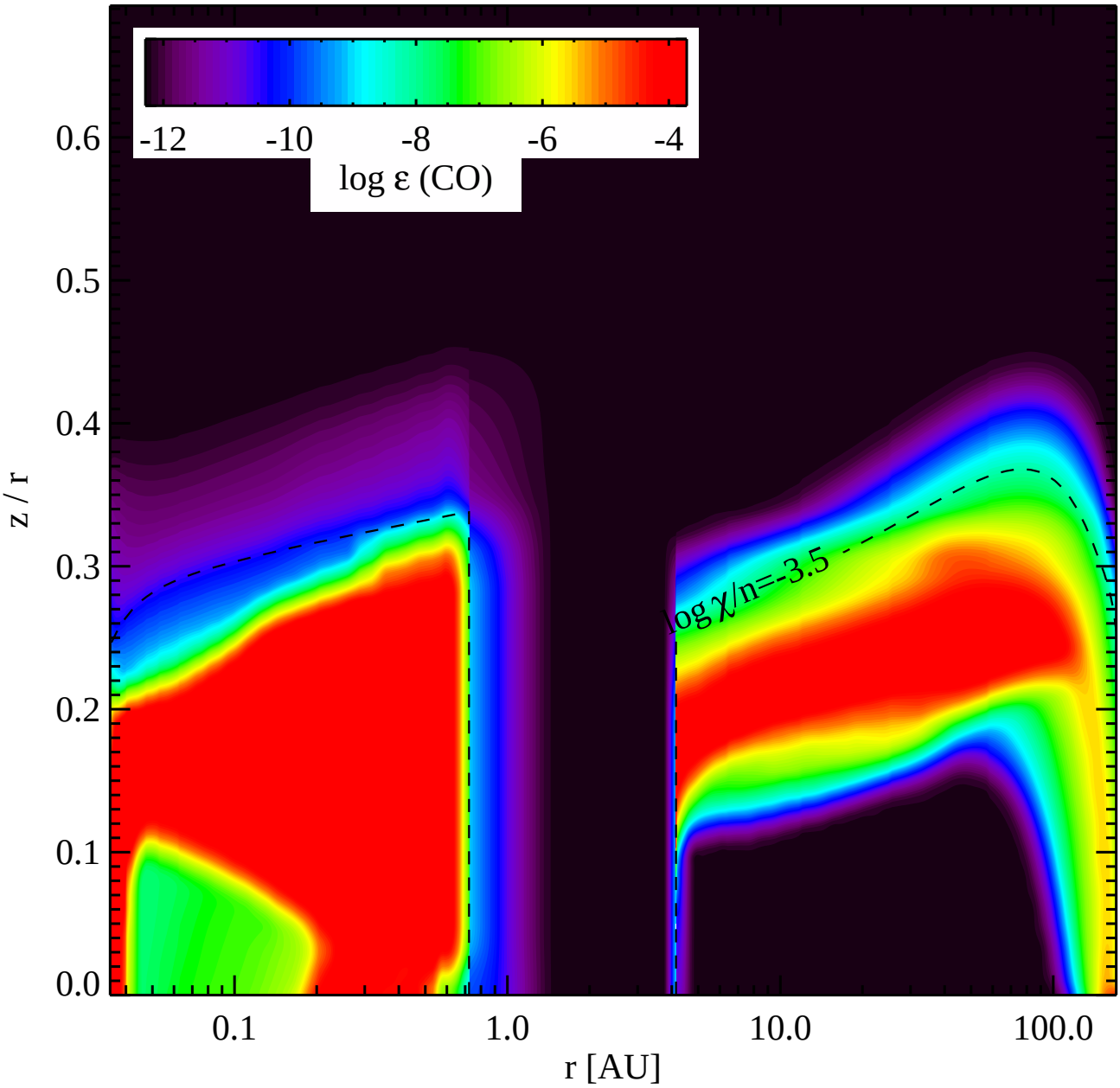

-12
-10
-8
-6
-4
log ε (O)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

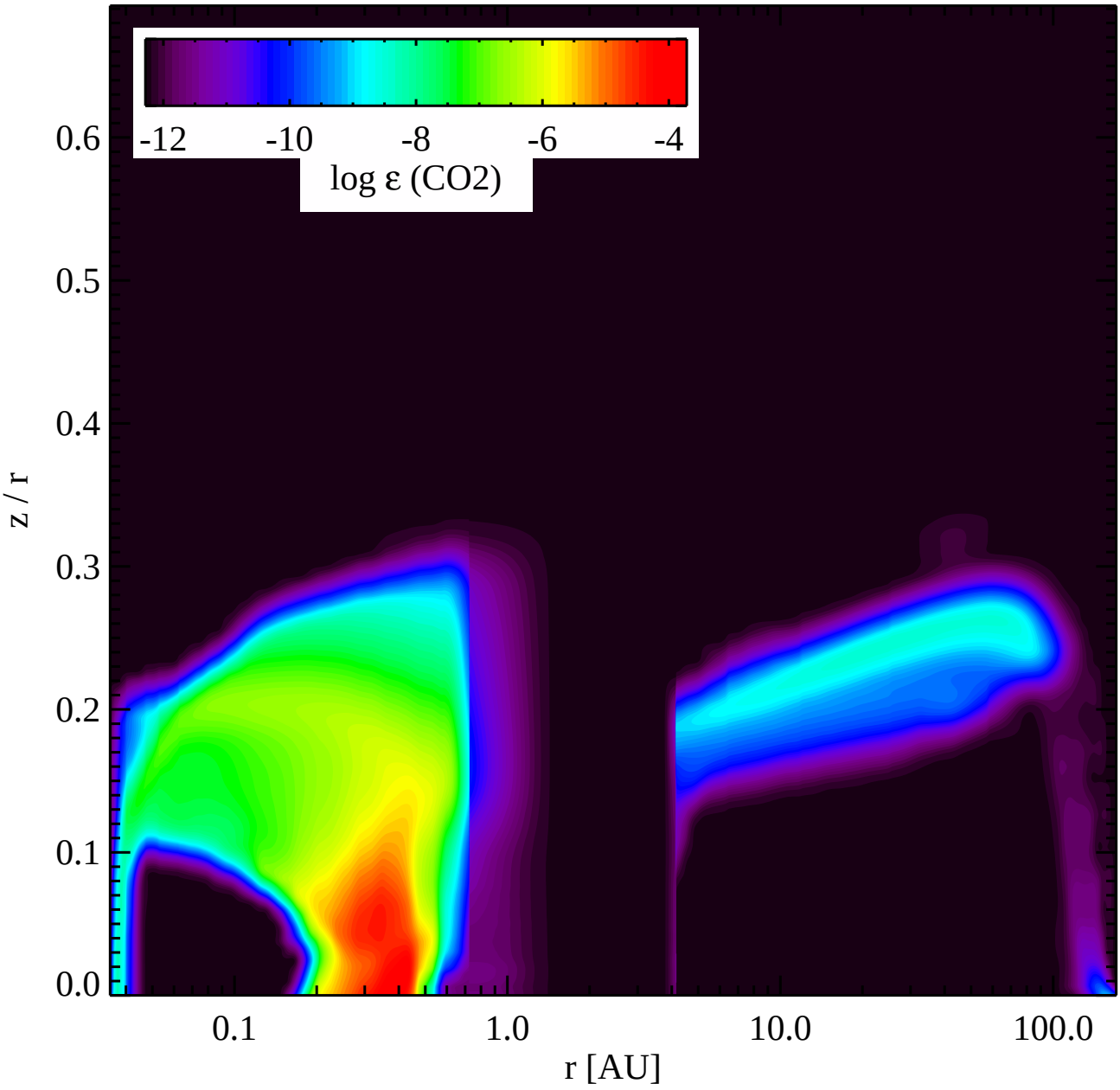

-12
-10
-8
-6
-4
log ε (OH)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

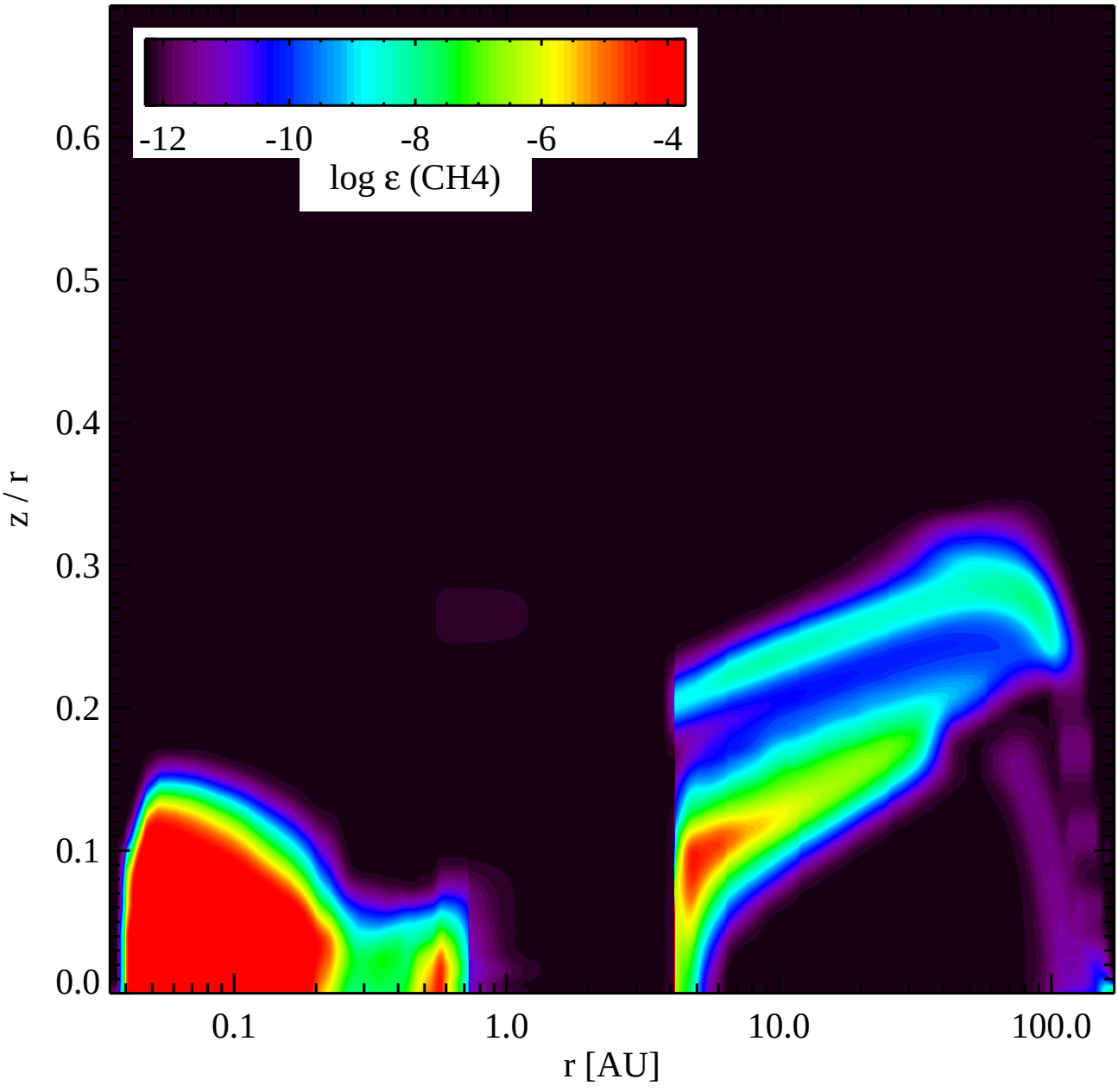

-12
-10
-8
-6
-4
log ε (H2O)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
2000K
2000K
2000K
2000K
Av=10
Av=10
0.1
1.0
10.0
100.0
r [AU]

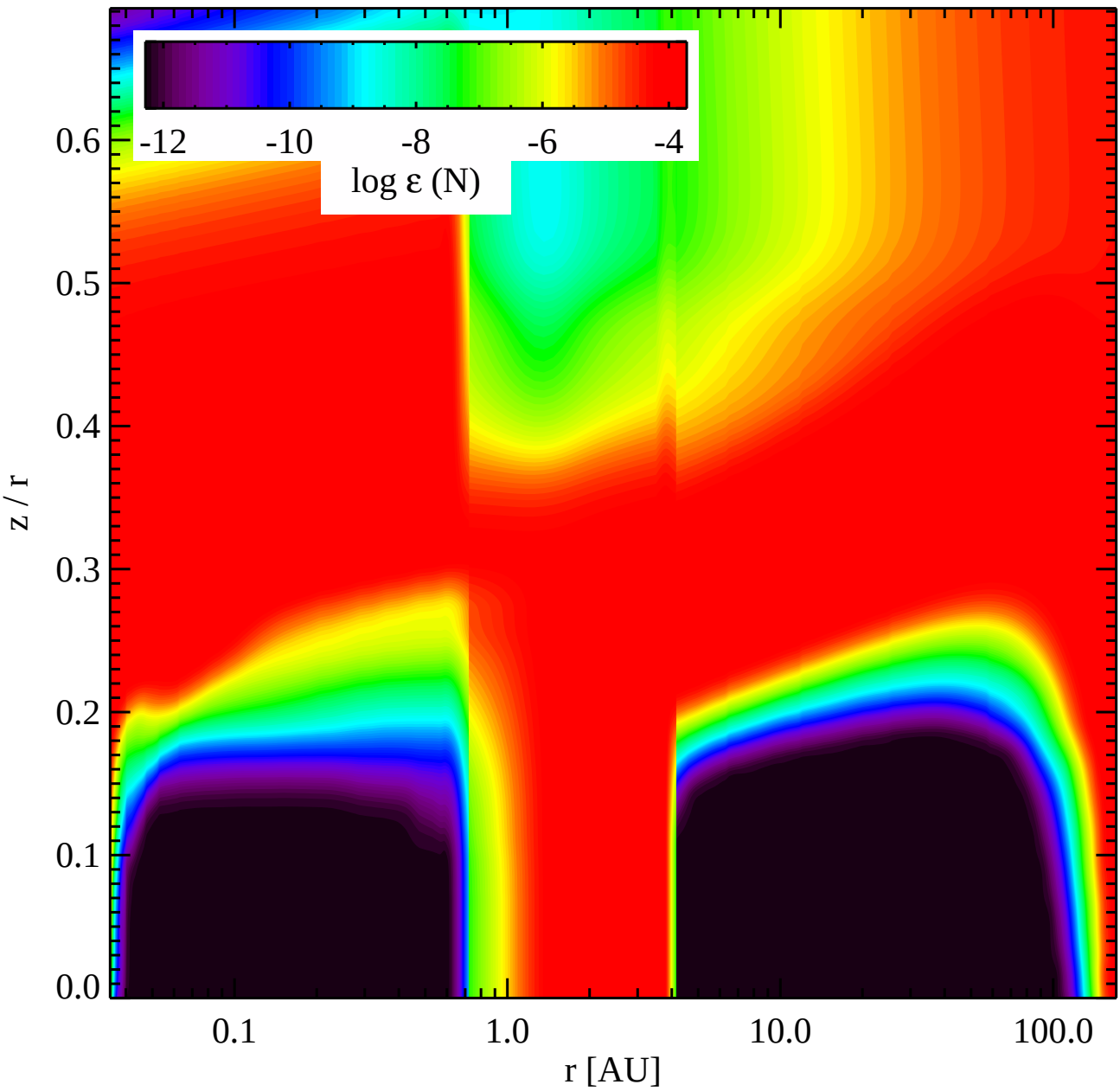

-12
-10
-8
-6
-4
log ε (C+)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]
-2
-3
-4
-5
-6
-1
-2
-3
-4
-5
-6

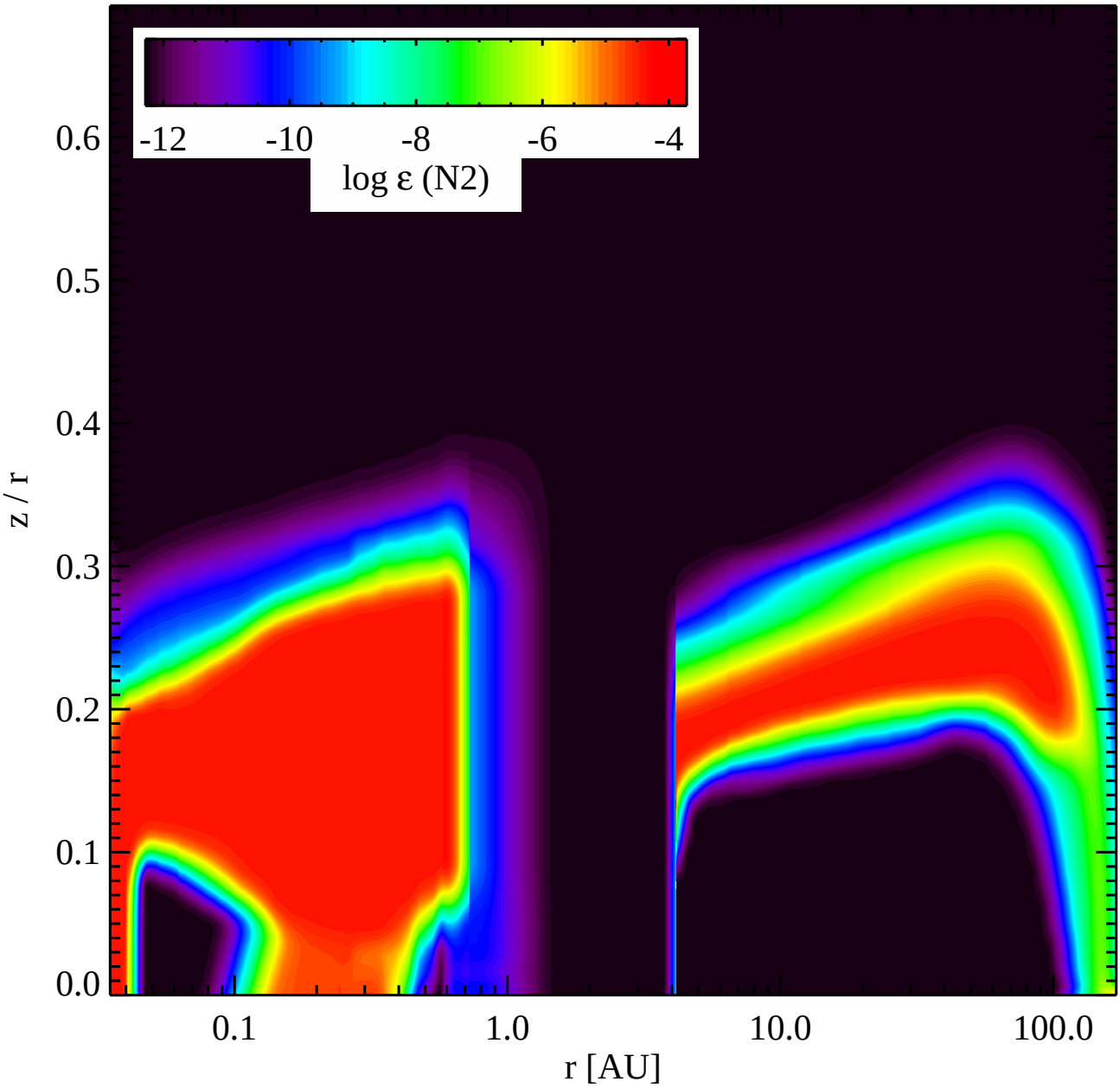

-12
-10
-8
-6
-4
log ε (C)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

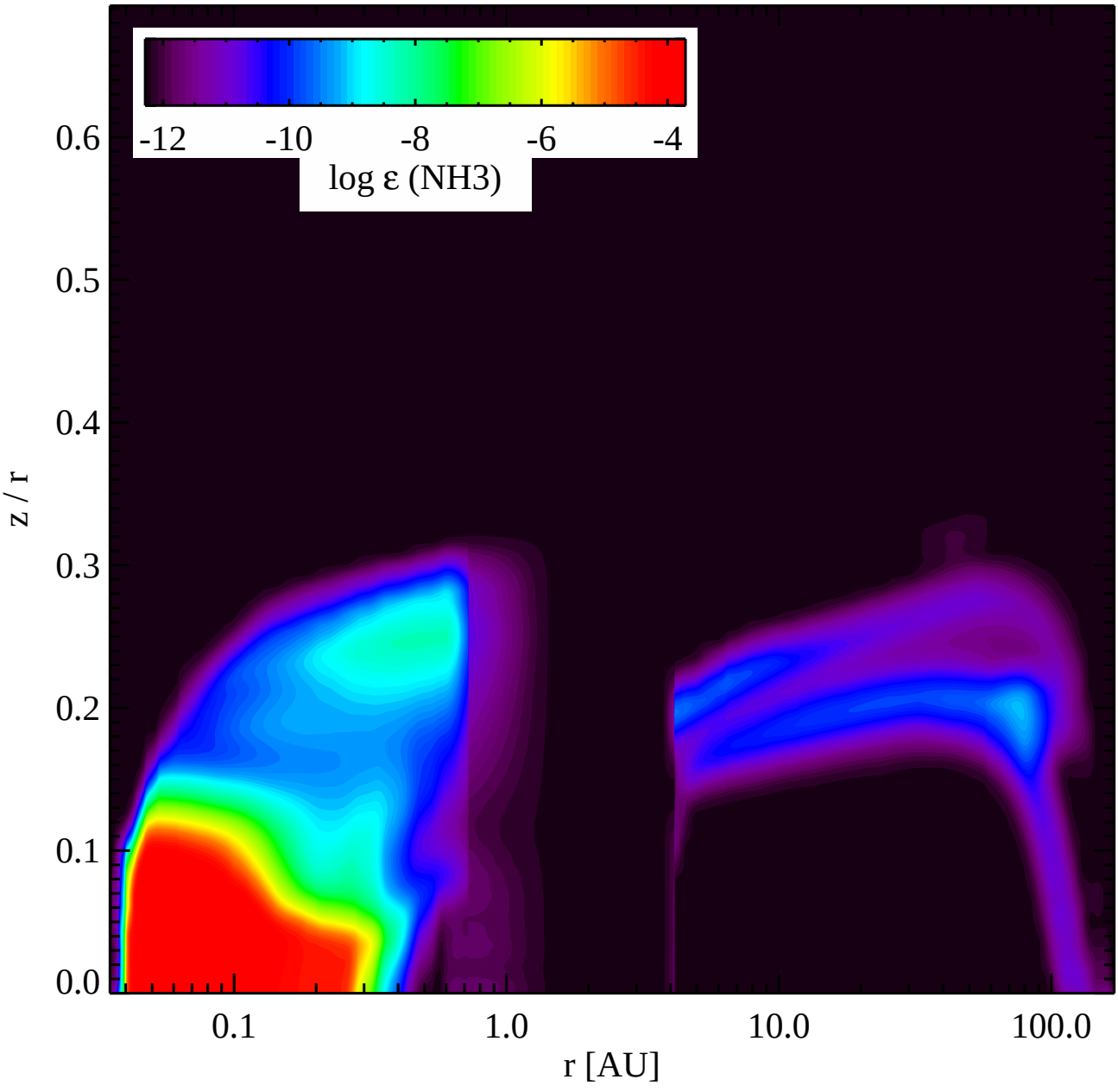

-12
-10
-8
-6
-4
log ε (CO)
log χ/n=-3.5
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

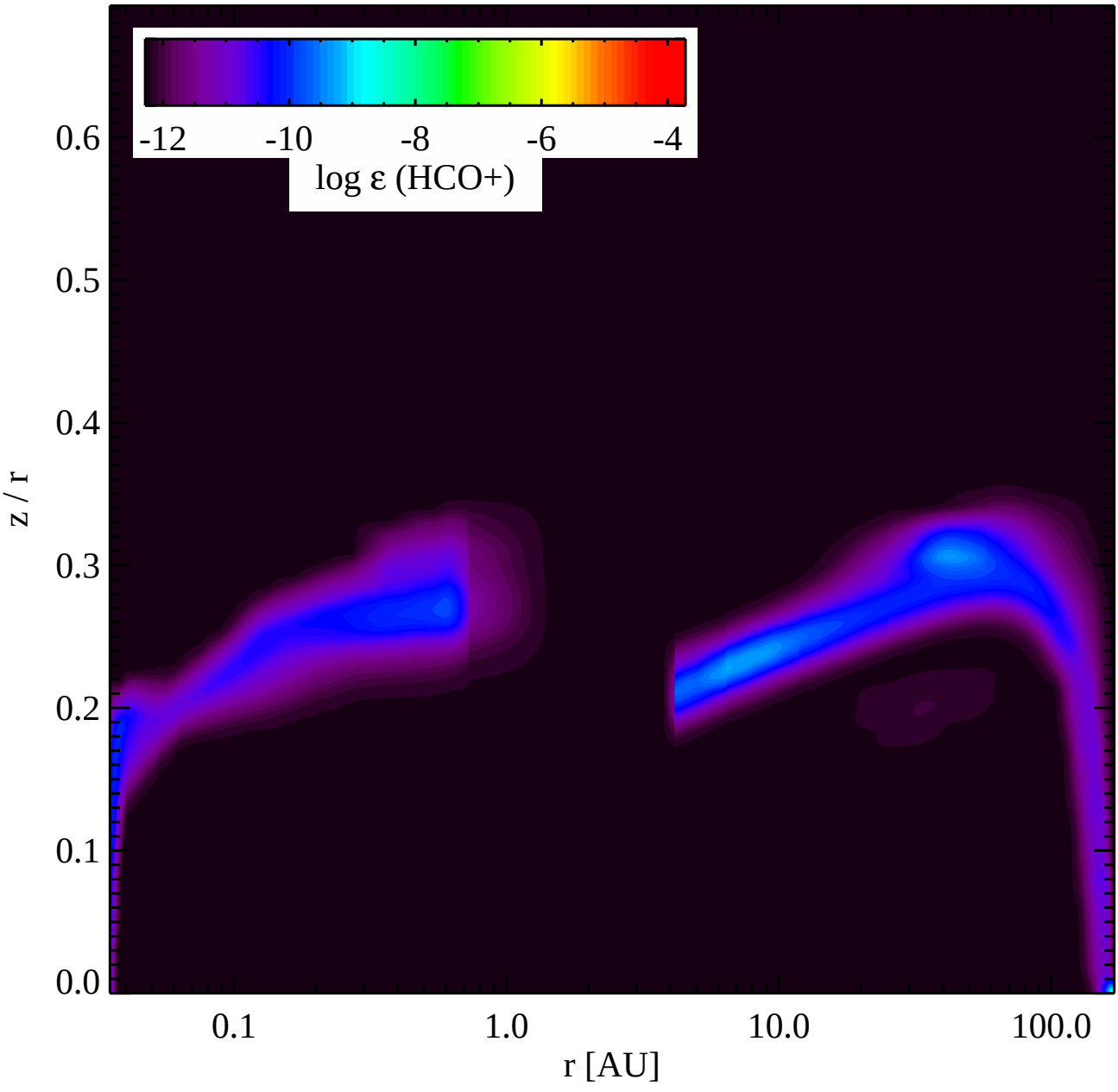

-12
-10
-8
-6
-4
log ε (CO2)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

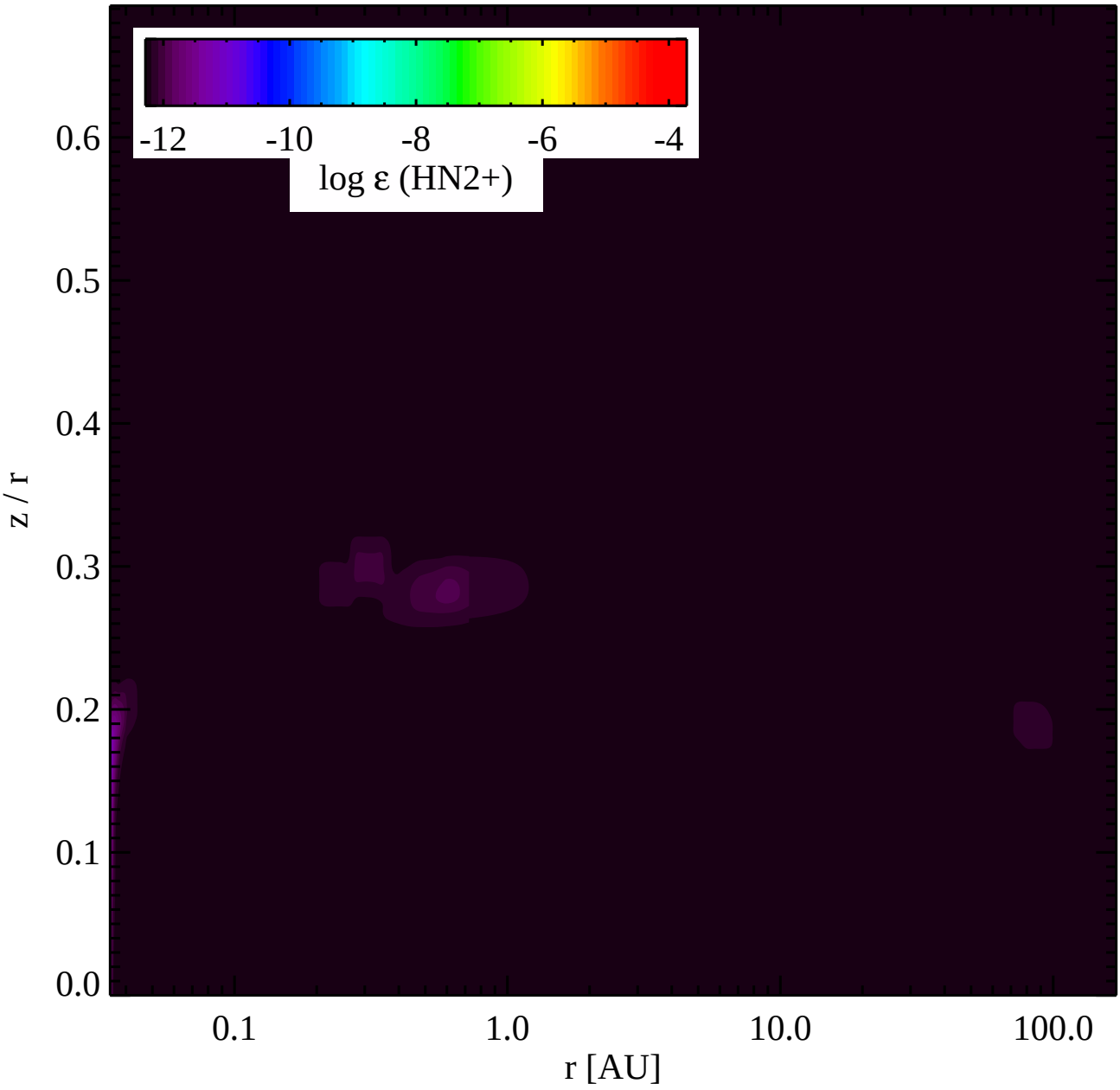

-12
-10
-8
-6
-4
log ε (CH4)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

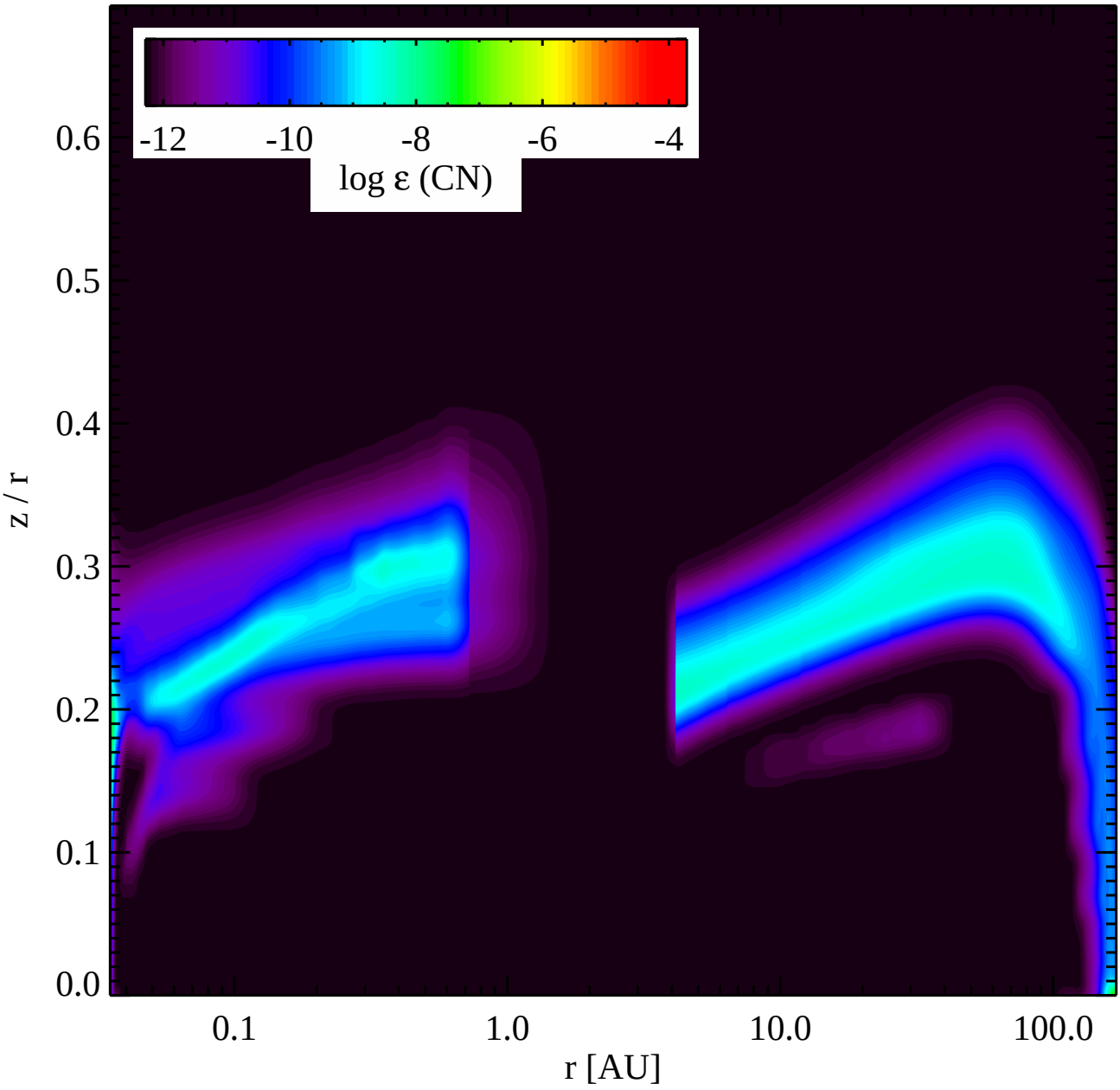

-12
-10
-8
-6
-4
log ε (N)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

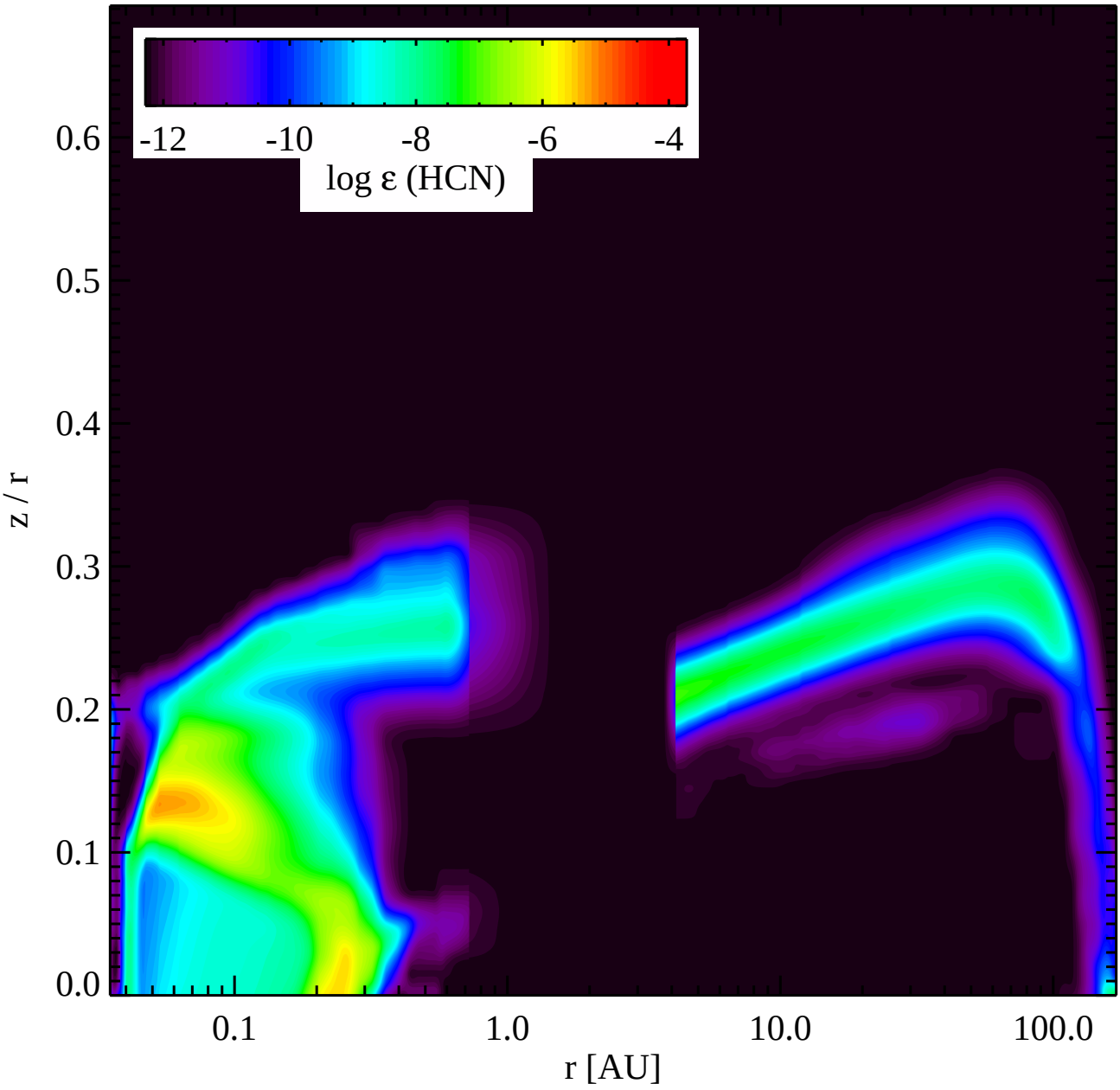

-12
-10
-8
-6
-4
log ε (N2)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

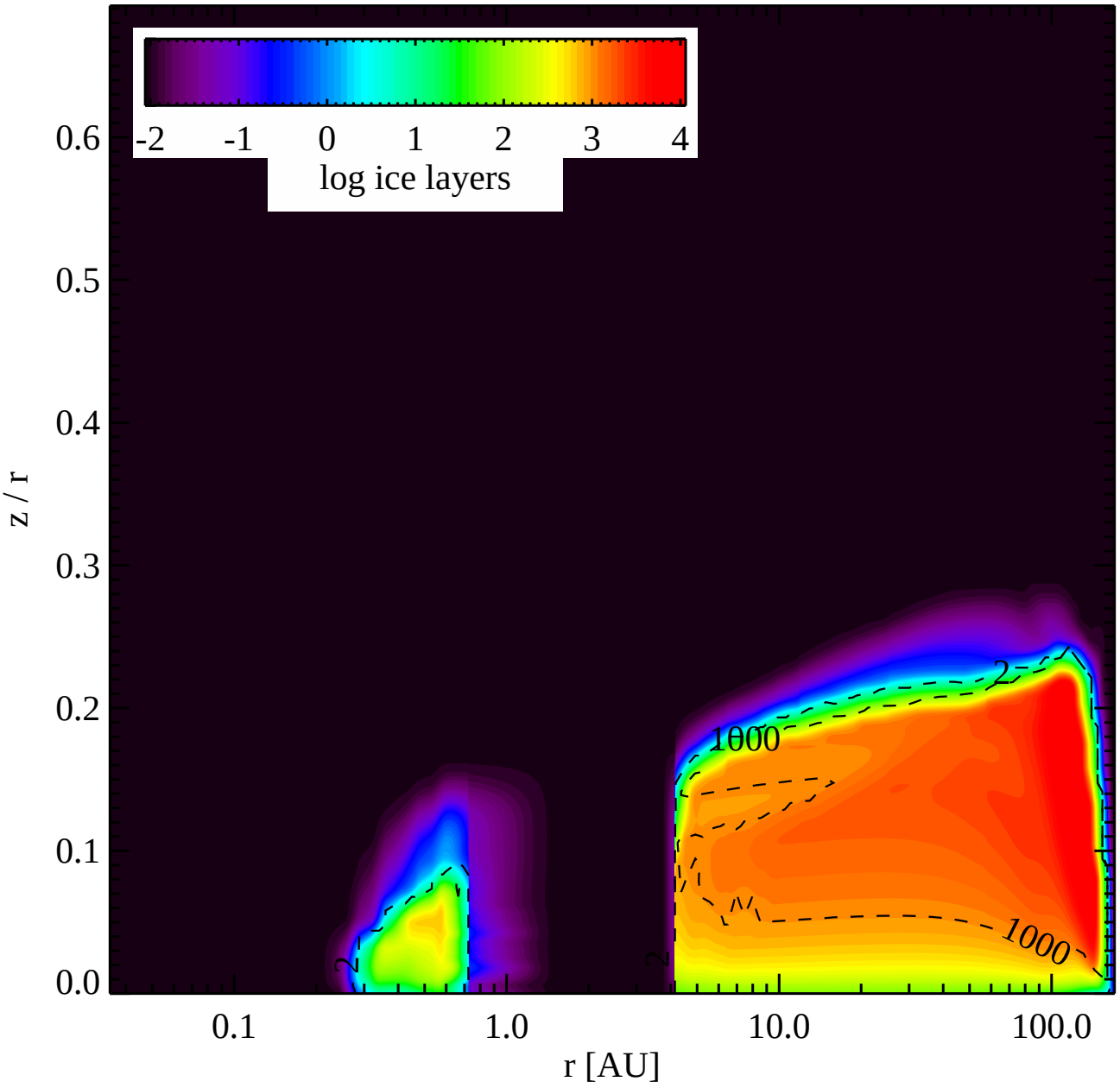

-12
-10
-8
-6
-4
log ε (NH3)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

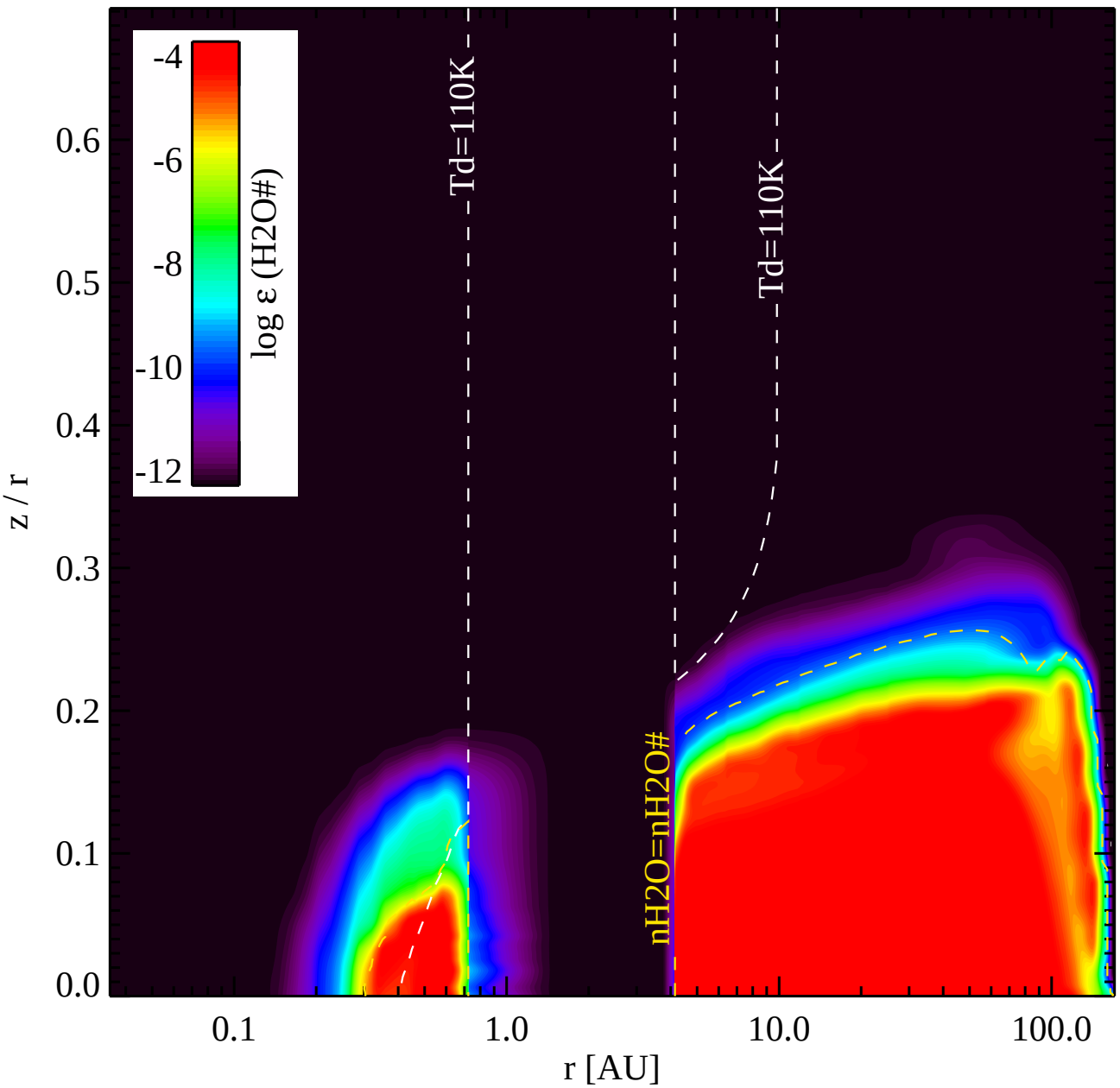

-12
-10
-8
-6
-4
log ε (HCO+)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

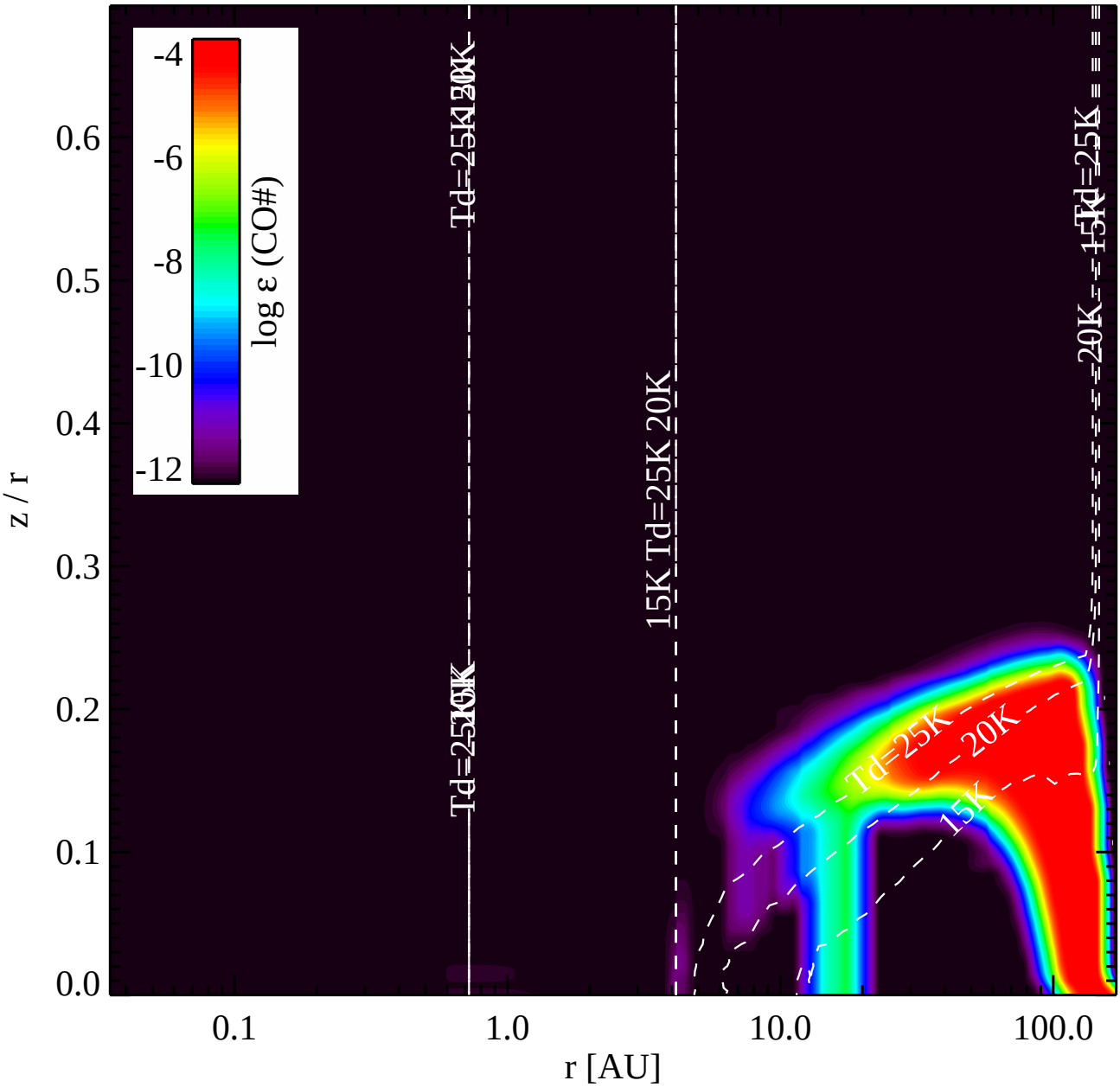

-12
-10
-8
-6
-4
log ε (HN2+)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

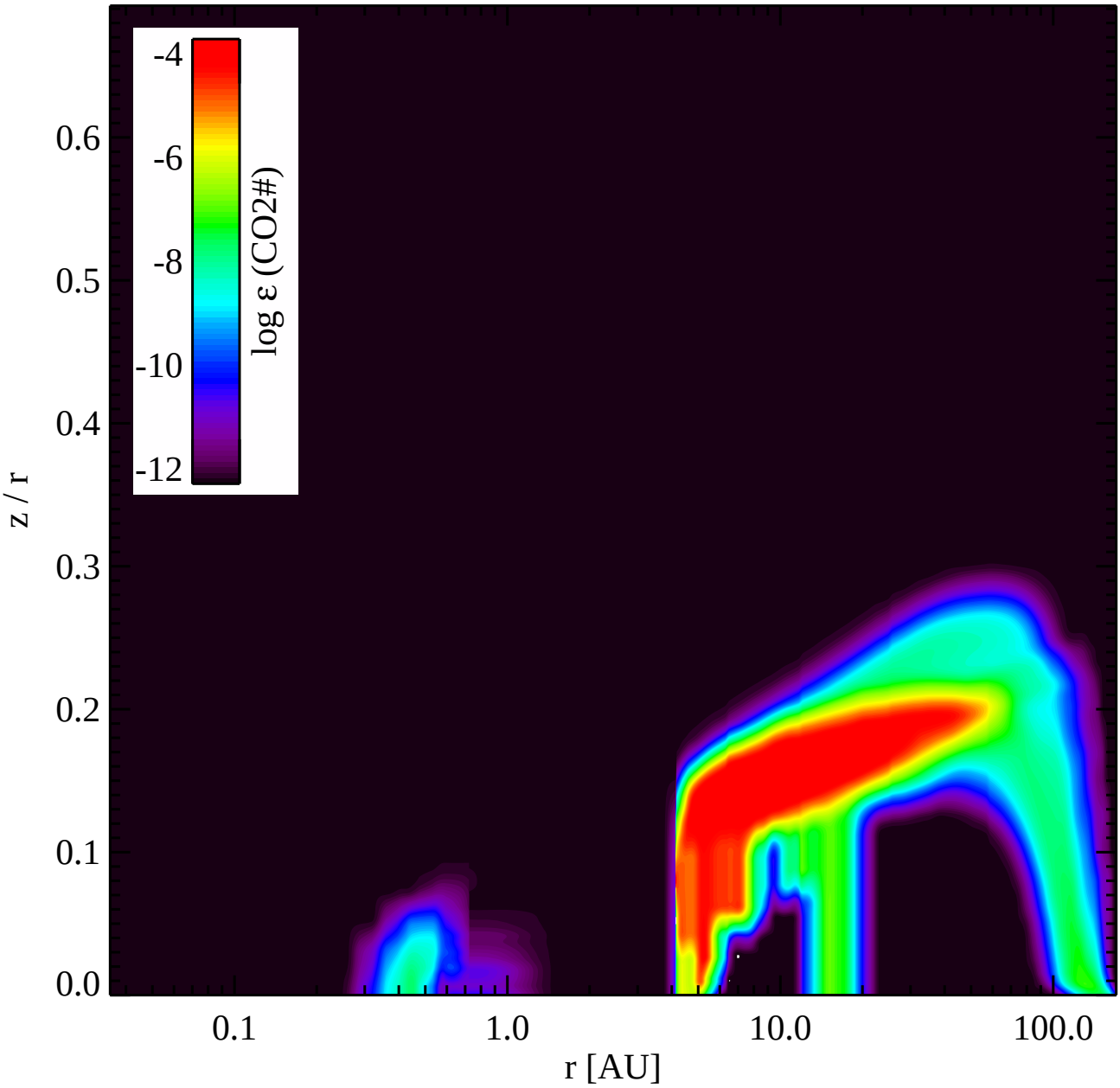

-12
-10
-8
-6
-4
log ε (CN)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

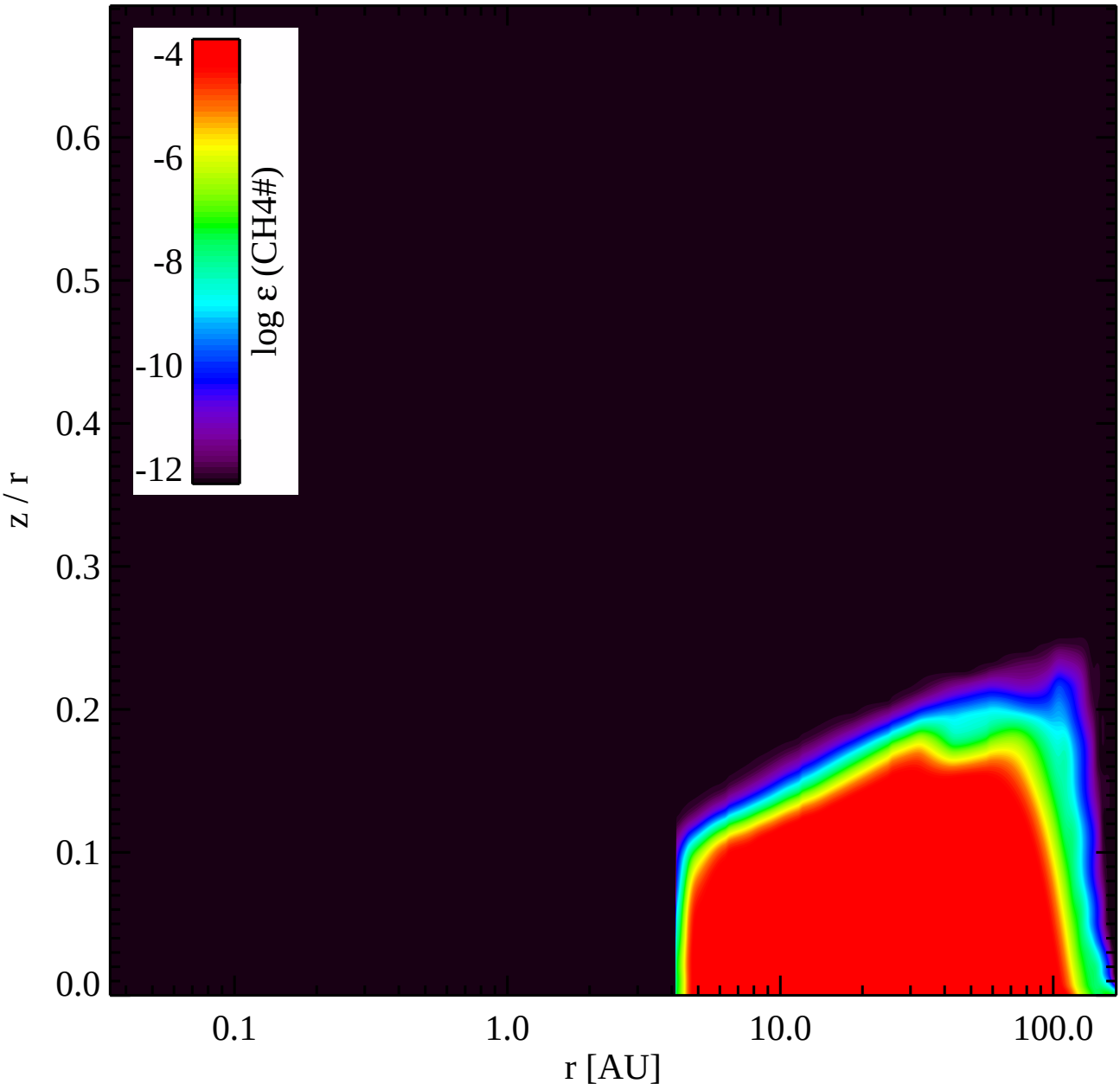

-12
-10
-8
-6
-4
log ε (HCN)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

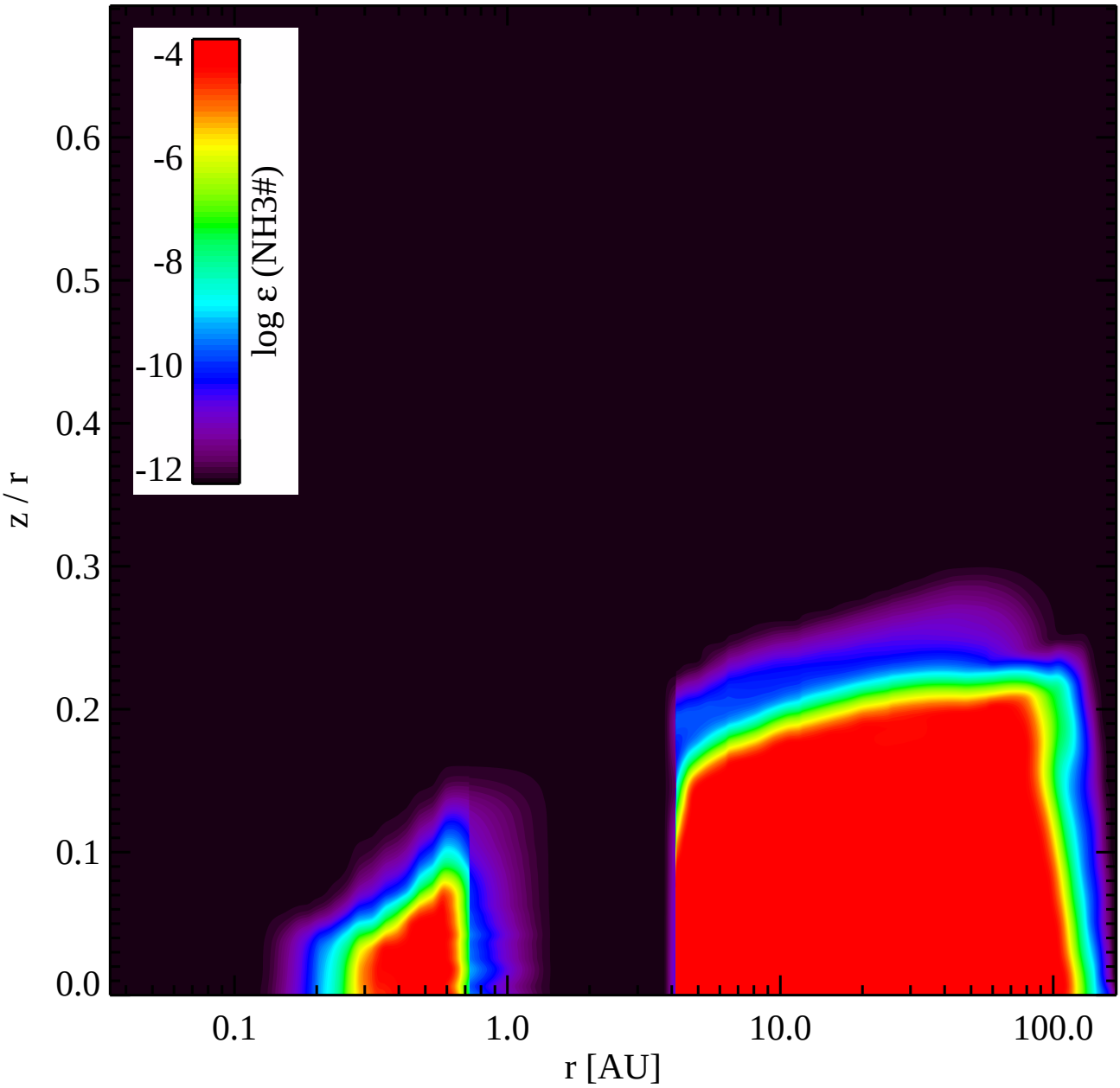

-2
-1
0
1
2
3
4
log ice layers
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]
2
1000
2
1000

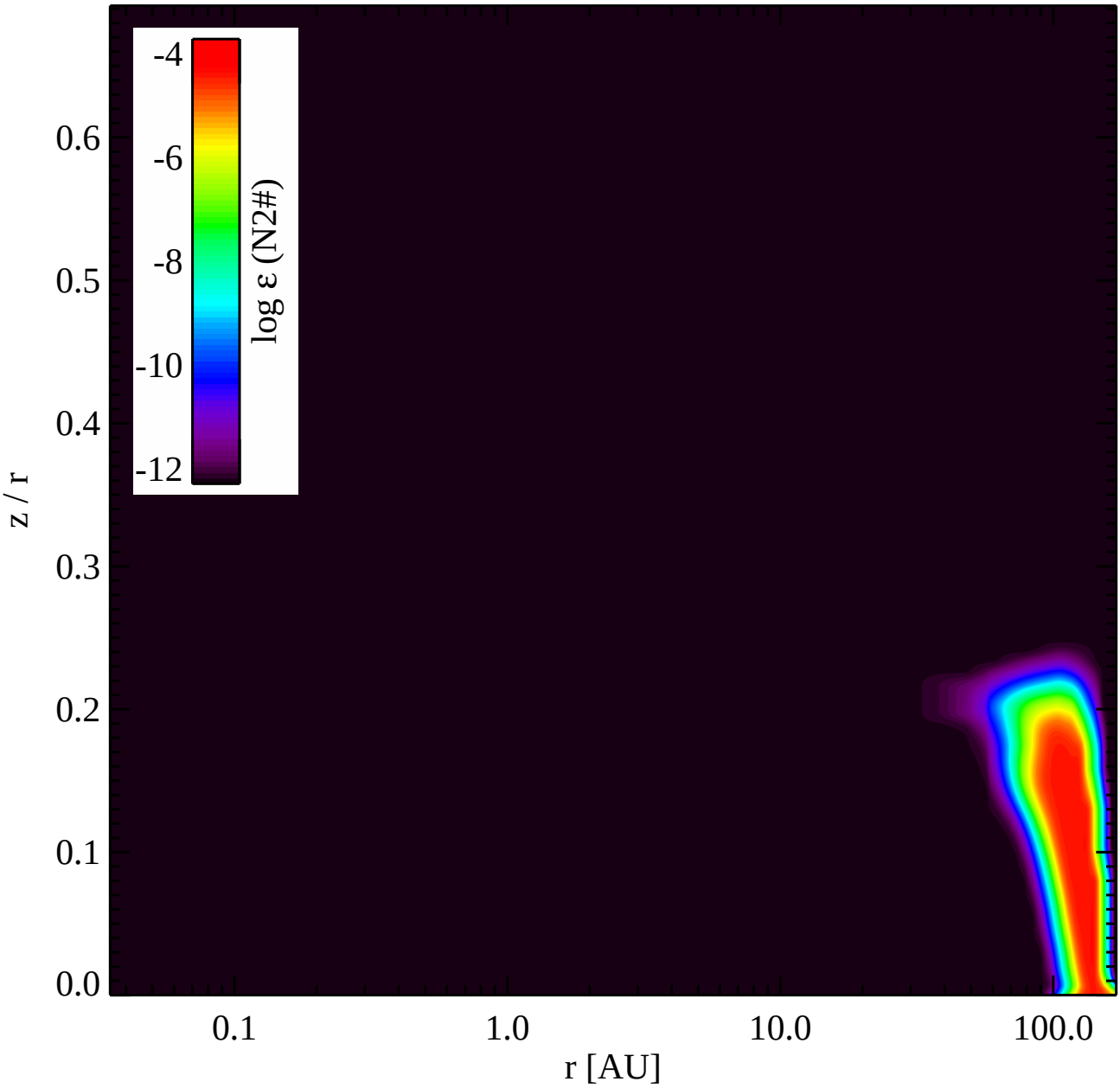

-4
-6
-8
-10
-12
log ε (H2O#)
Td=110K
Td=110K
nH2O=nH2O#
0.0
0.1
0.2
0.3
0.4
0.5
0.6
z / r
0.1
1.0
10.0
100.0
r [AU]

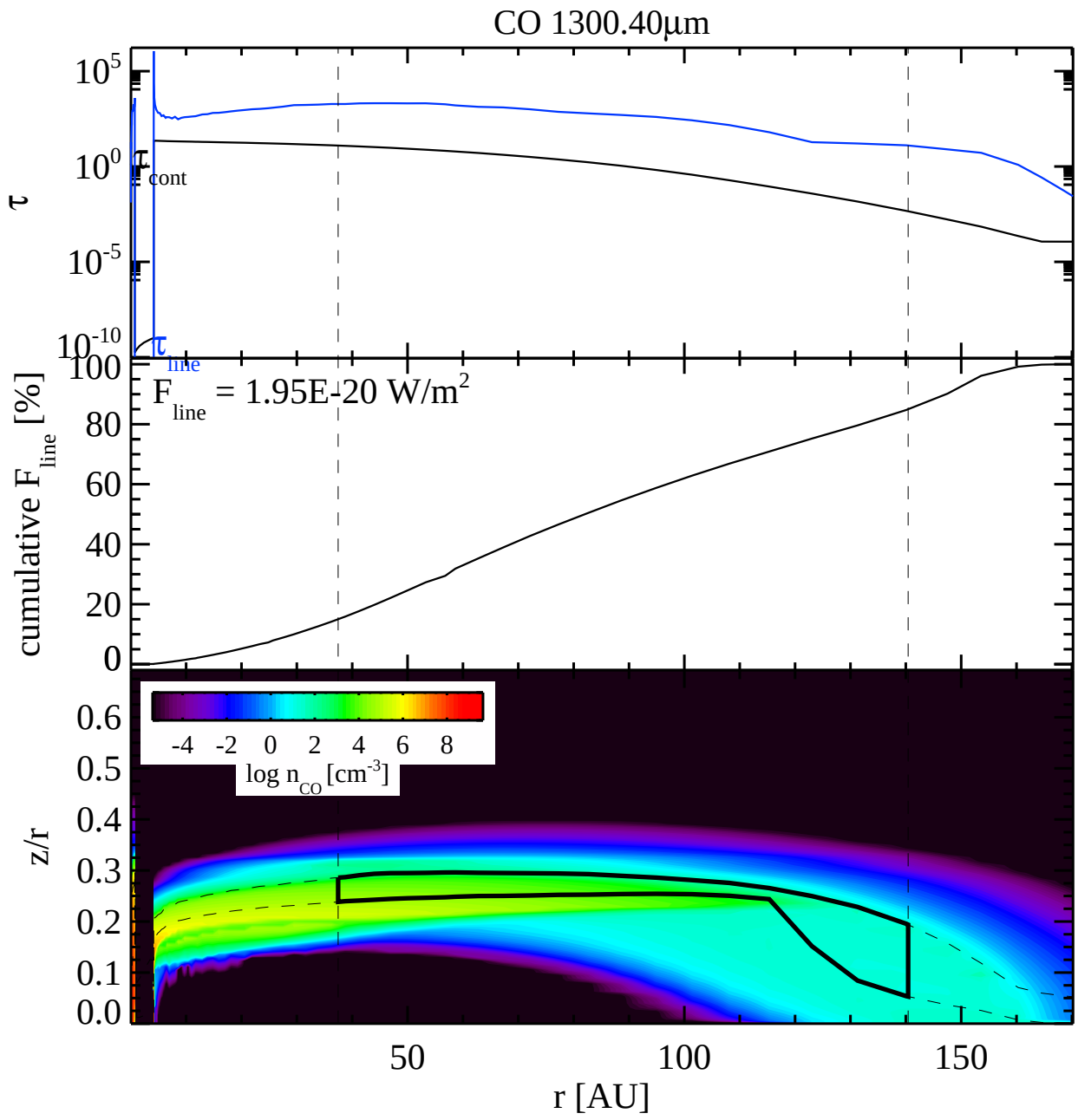

-4
-6
-8
-10
-12
log ε (CO#)
Td=25K
20K
15K
0.0
0.1
0.2
0.3
0.4
0.5
0.6
z / r
0.1
1.0
10.0
100.0
r [AU]

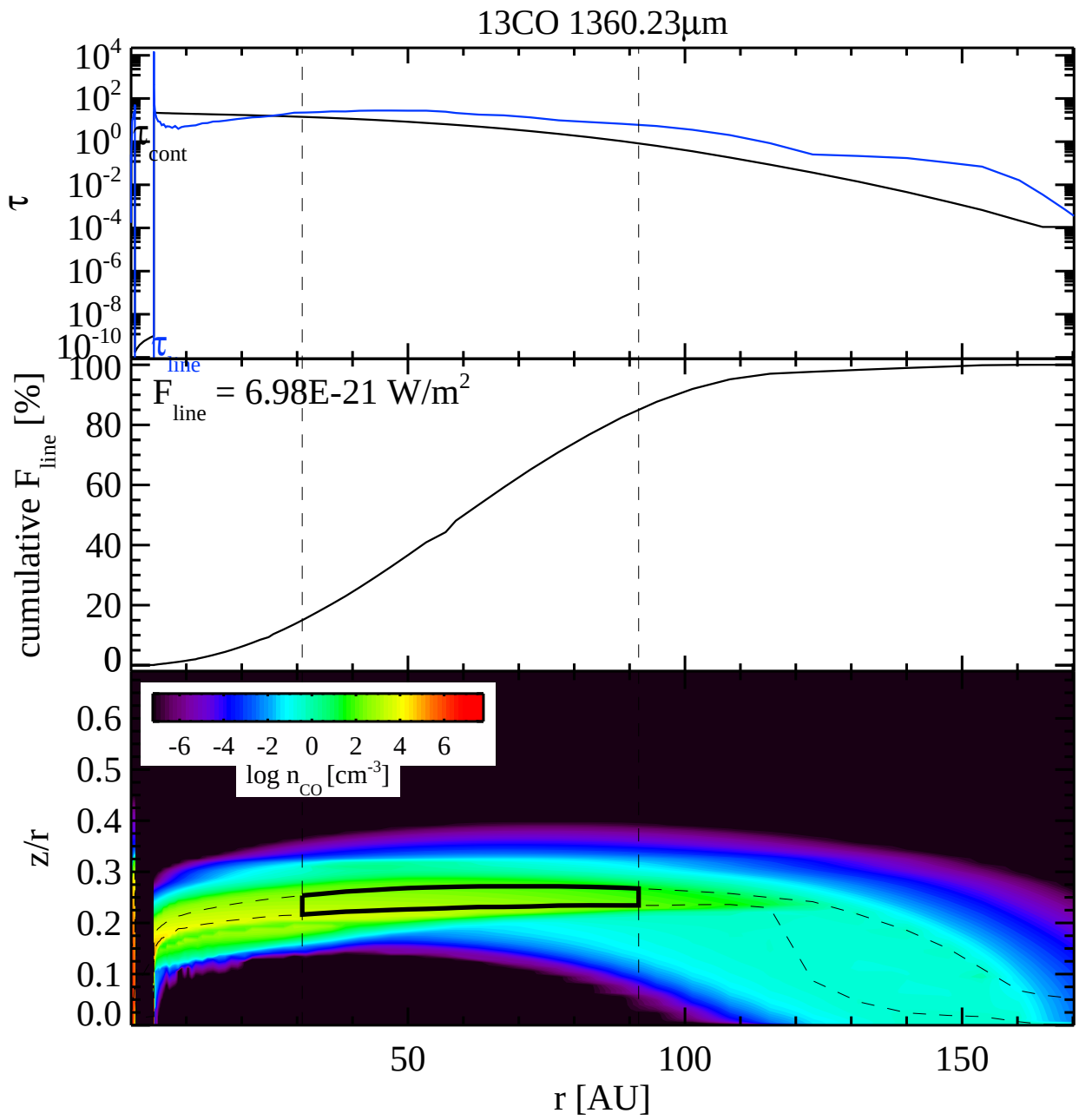

-4
-6
-8
-10
-12
log ε (CO2#)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

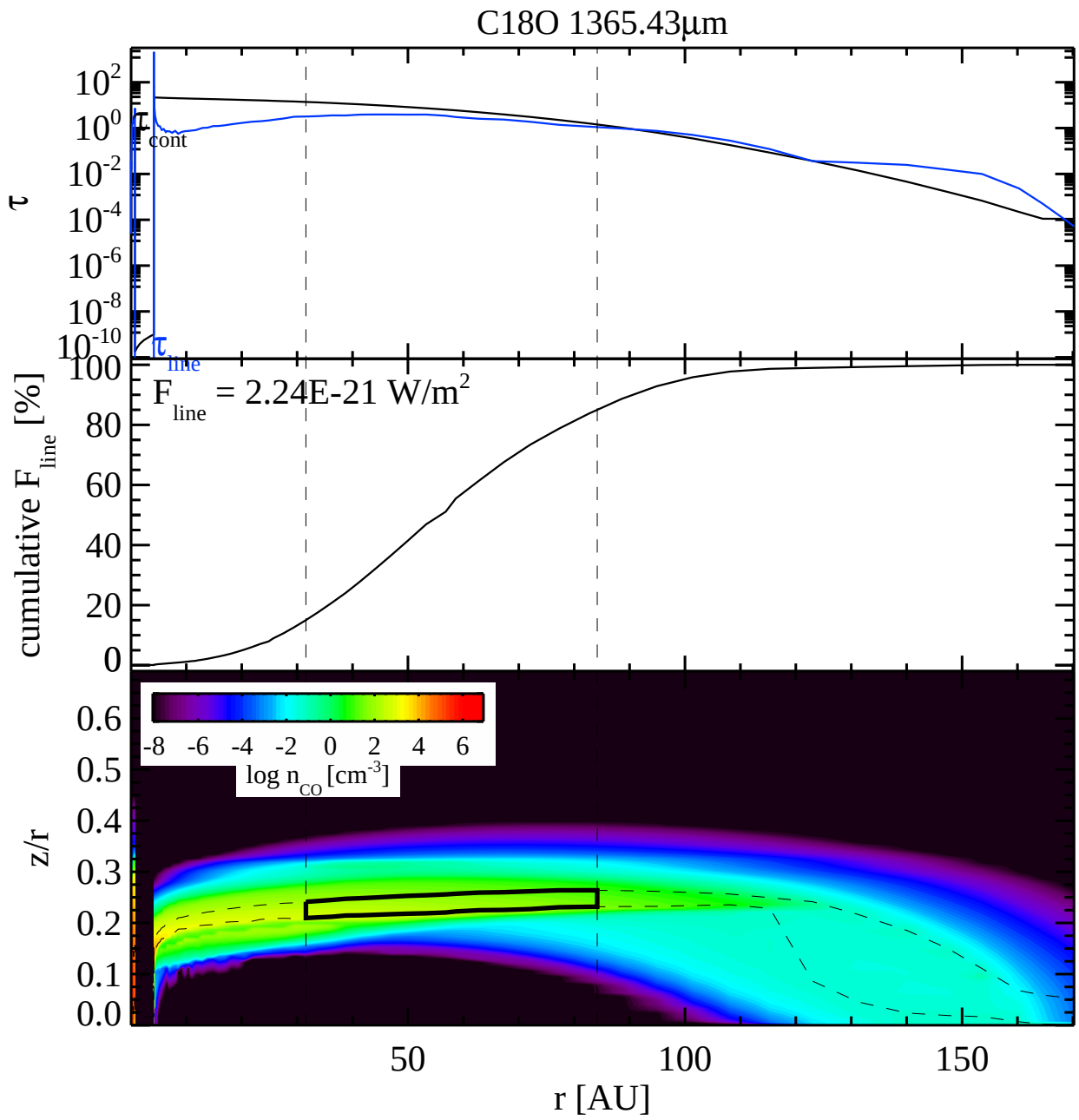

-4
-6
-8
-10
-12
log ε (CH4#)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

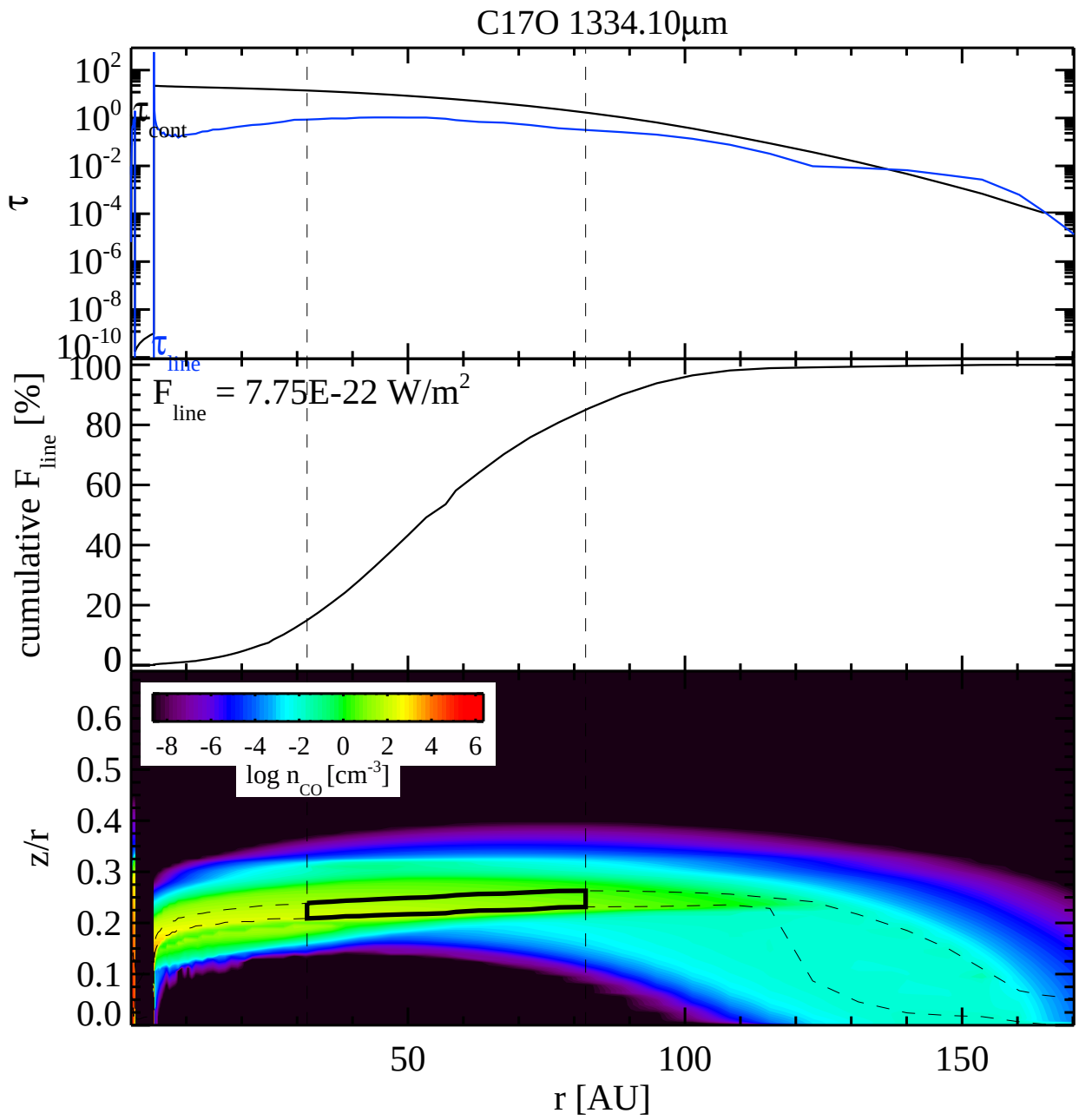

-4
-6
-8
-10
-12
log ε (NH3#)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

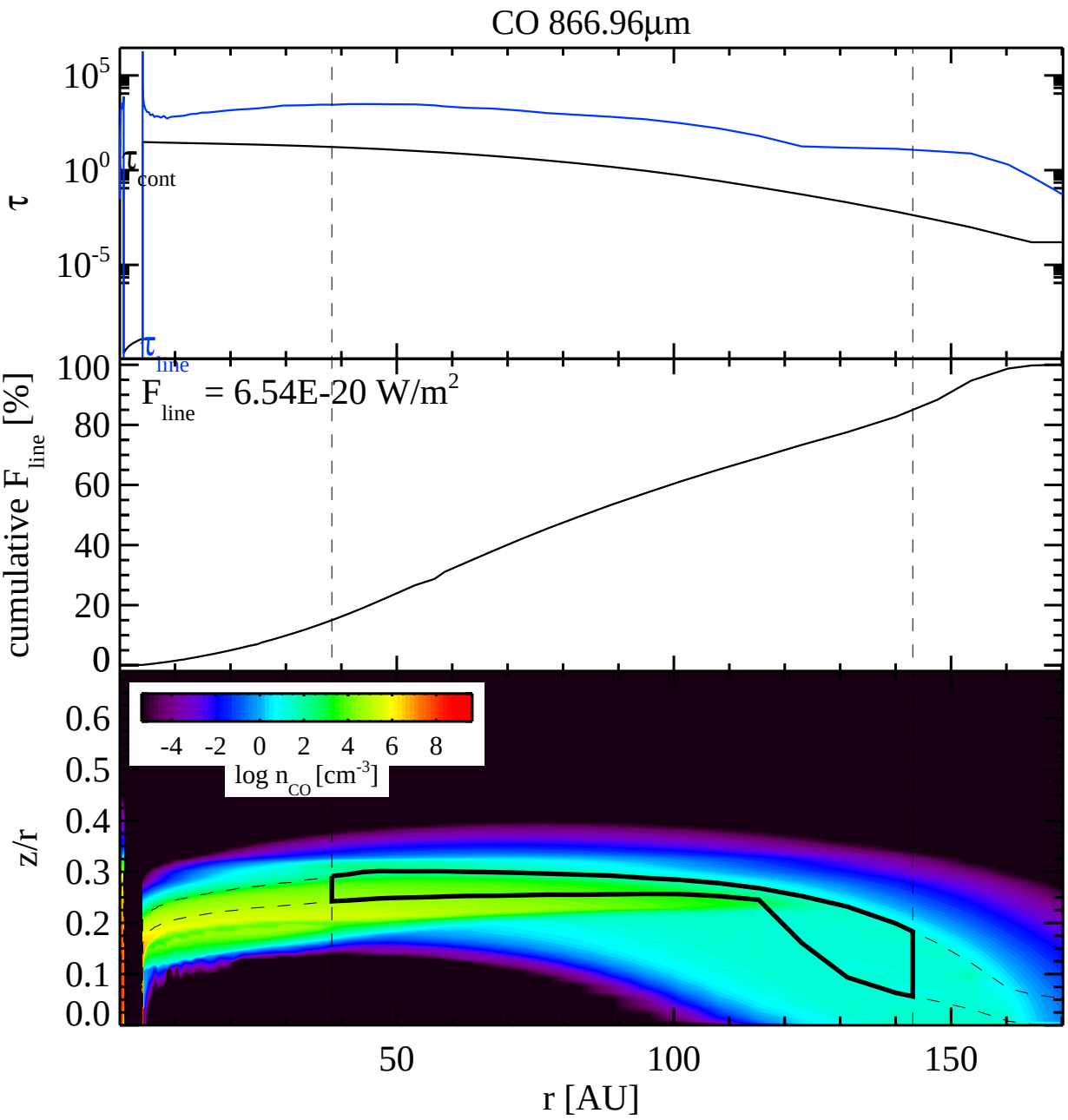

-4
-6
-8
-10
-12
log ε (N2#)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
z / r
0.1
1.0
10.0
100.0
r [AU]

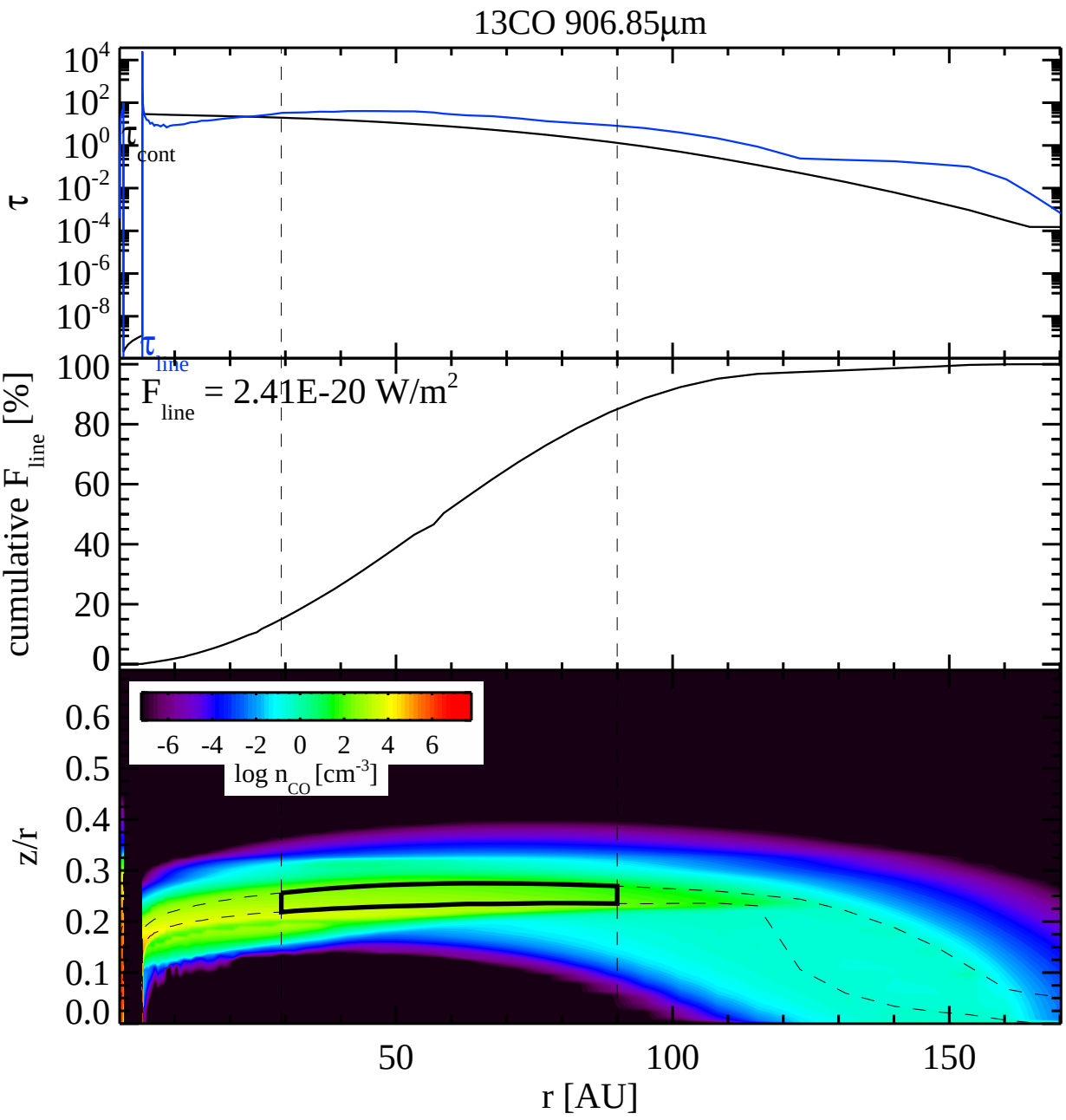

CO 1300.40µm
τ
10^{5}
10^{0}
10^{-5}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.95E-20 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
50
100
150
r [AU]

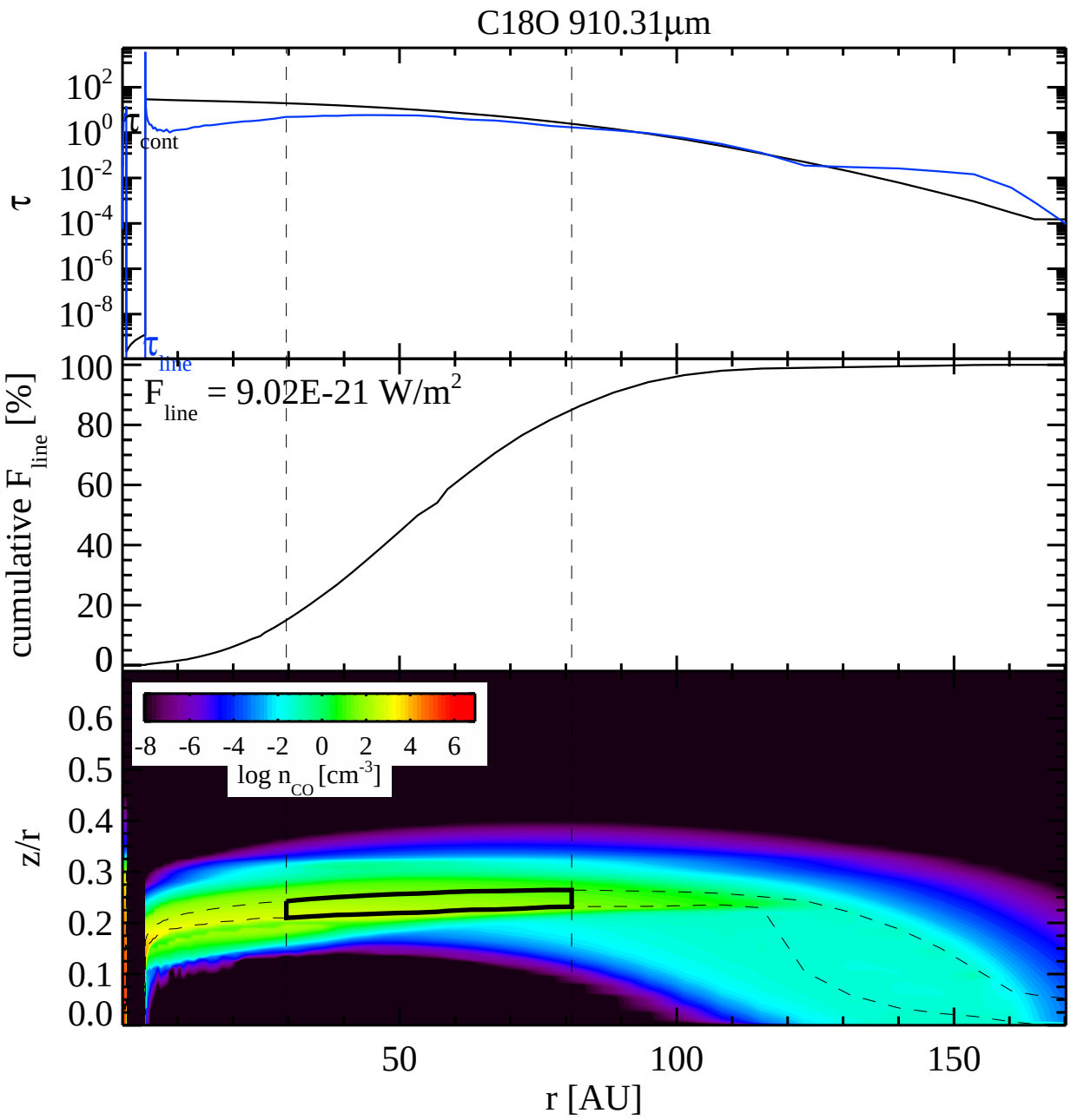

13CO 1360.23µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 6.98E-21 W/m^2
100
80
60
40
20
0
-6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
50
100
150
r [AU]

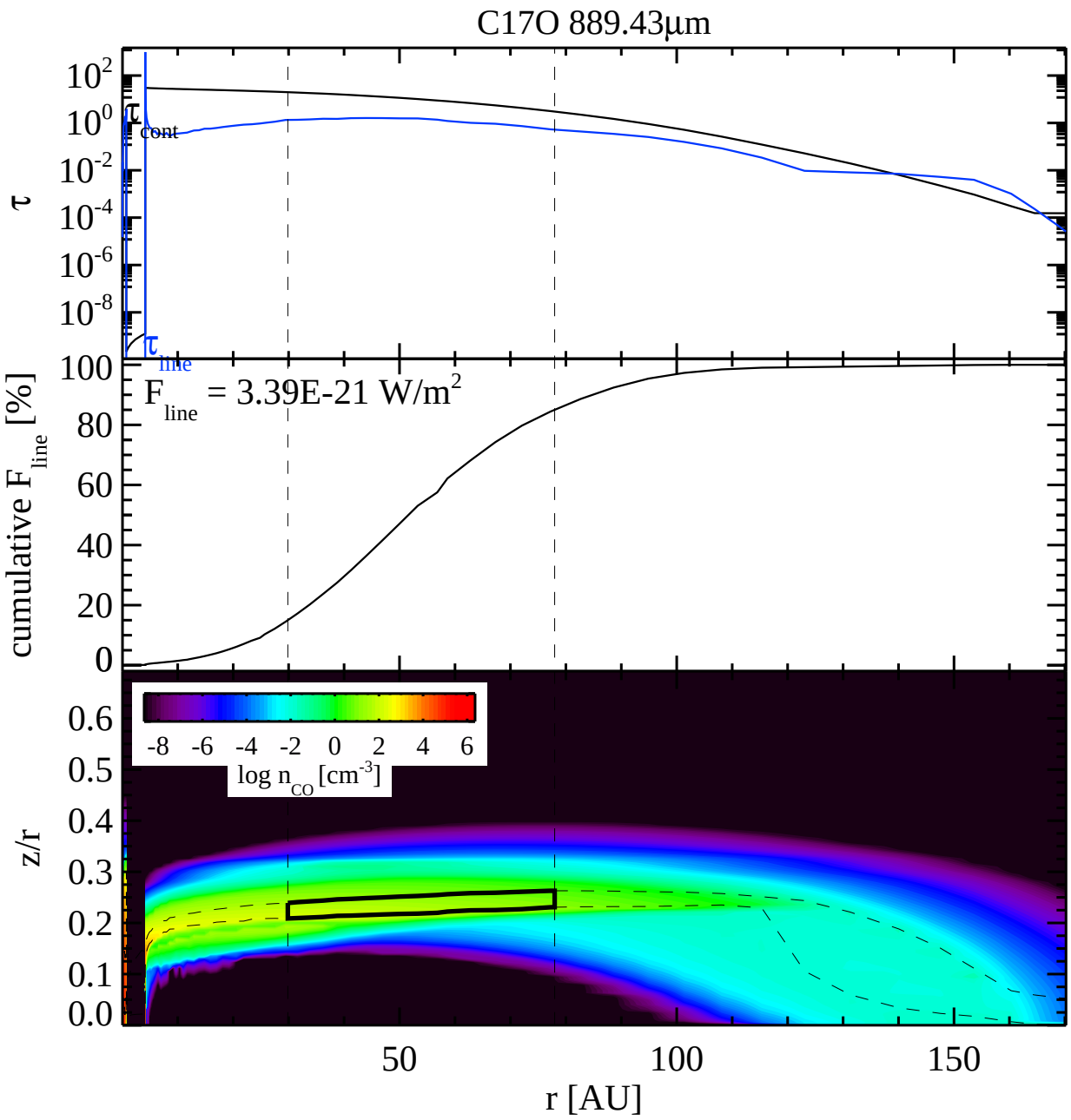

C18O 1365.43µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 2.24E-21 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
50
100
150
r [AU]

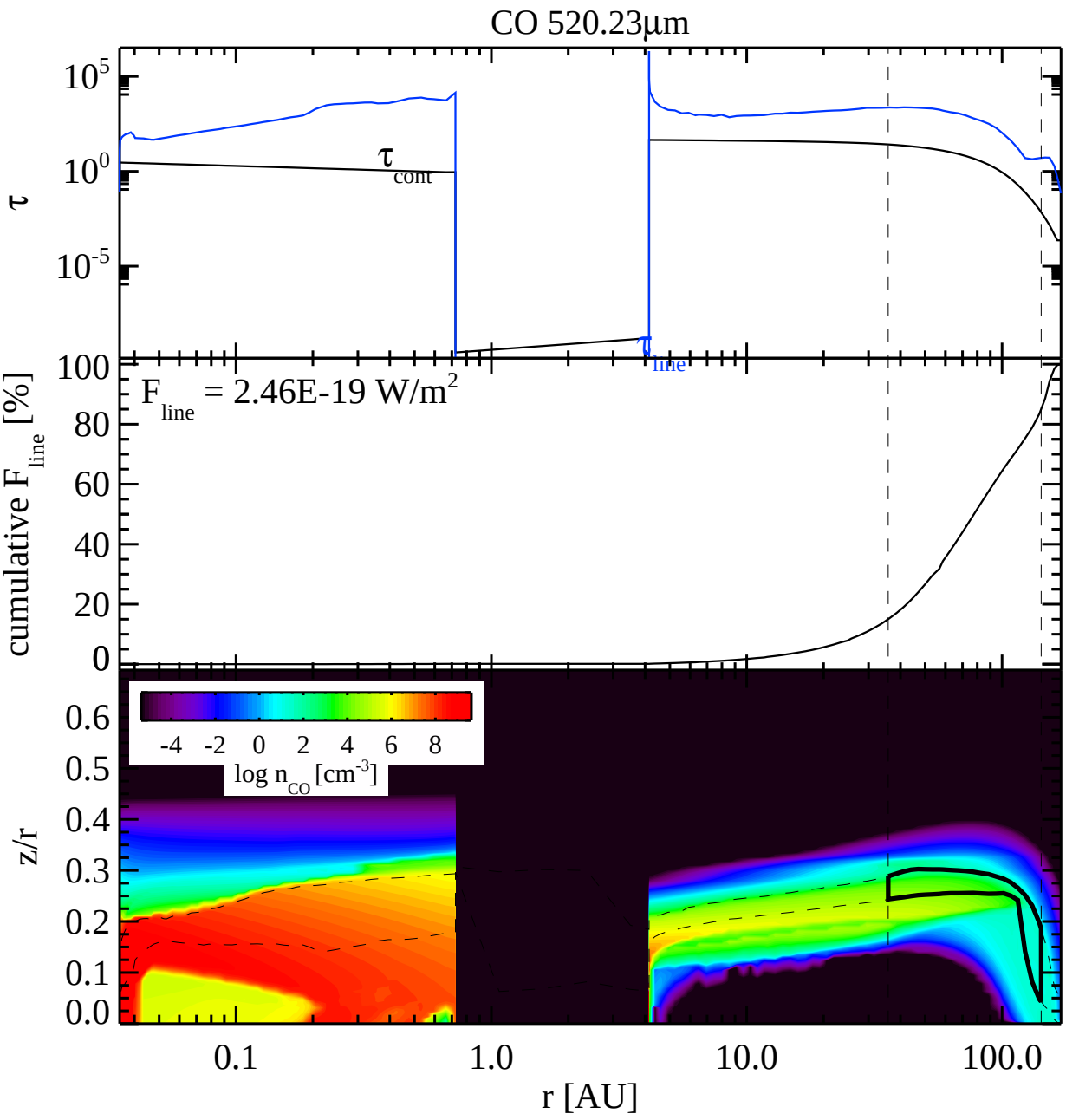

C17O 1334.10µm
τ
τ cont
τ line
cumulative F line [%]
F line = 7.75E-22 W/m2
log n CO [cm-3]
z/r
r [AU]

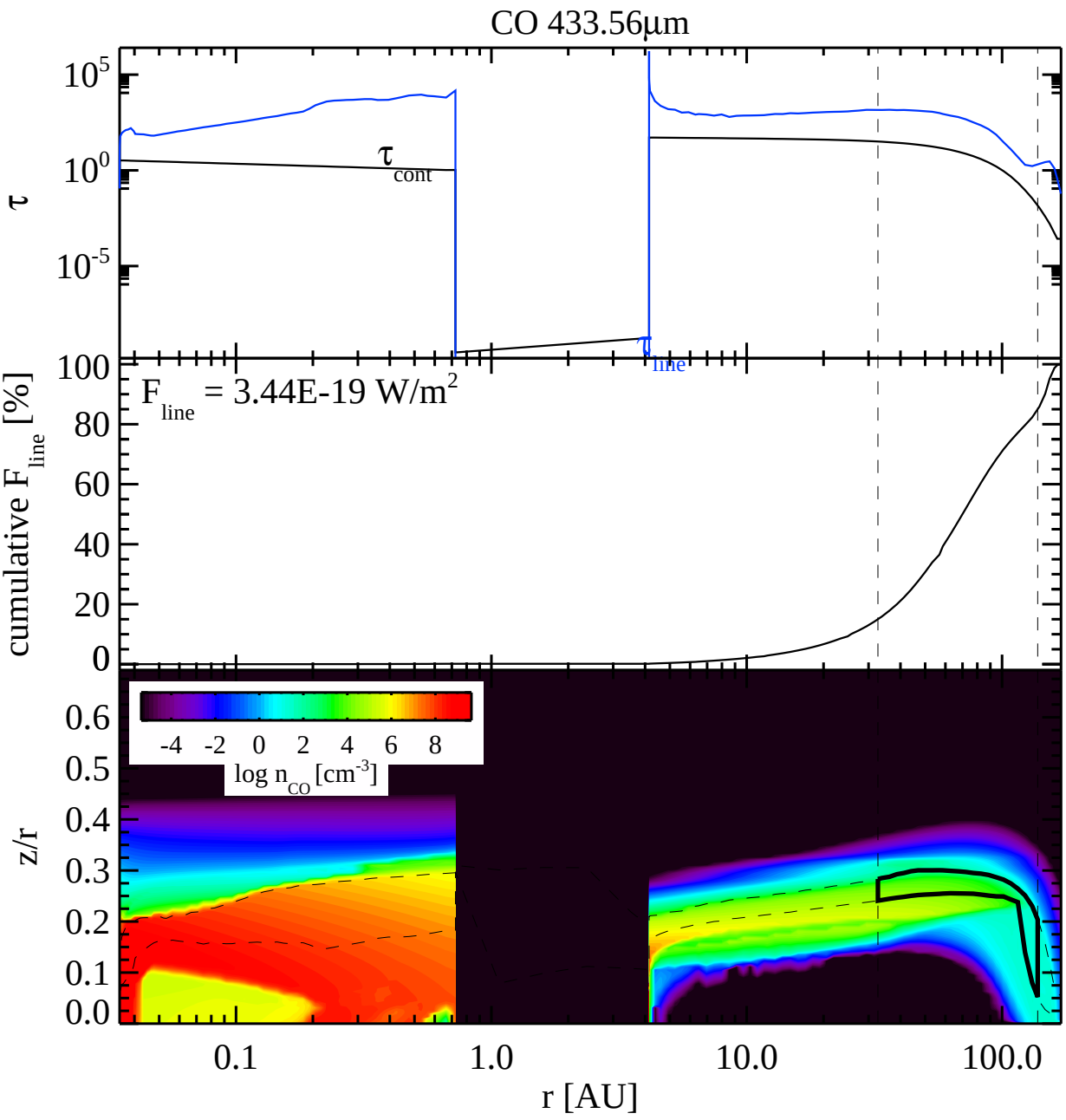

CO 866.96µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 6.54E-20 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
50
100
150
r [AU]

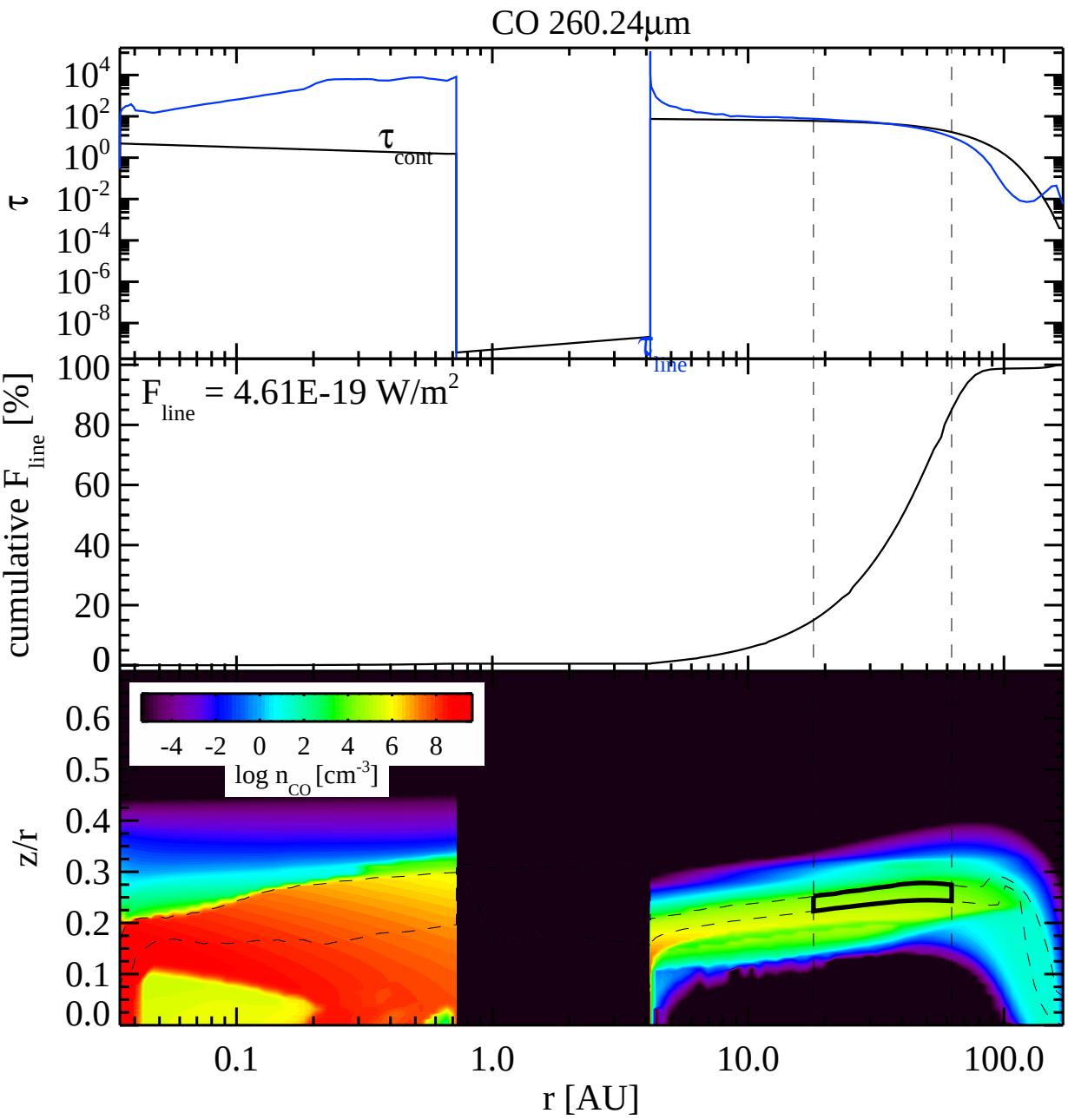

13CO 906.85µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.41E-20 W/m2
log n CO [cm-3]
z/r
r [AU]

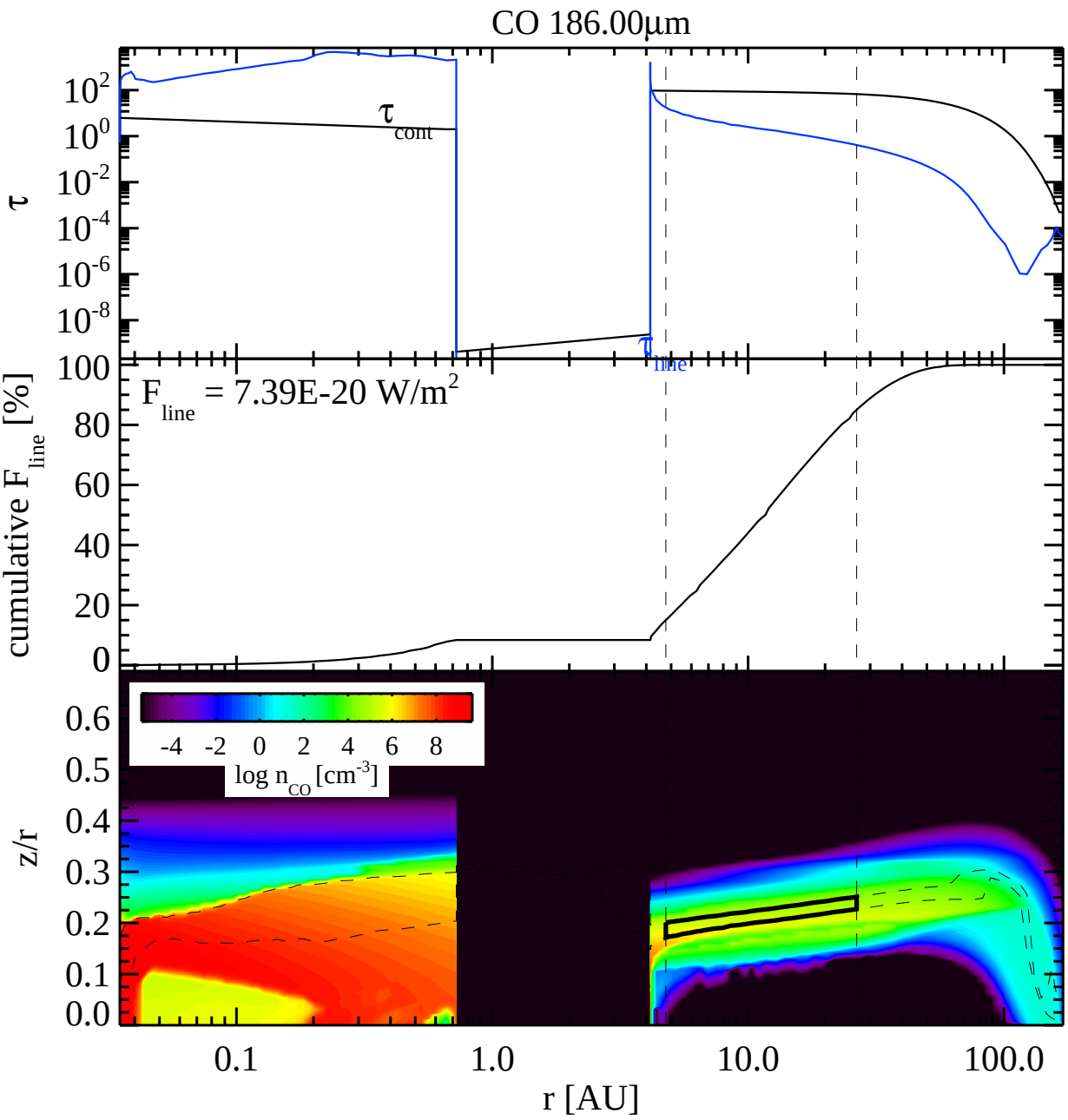

C18O 910.31µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 9.02E-21 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
50
100
150
r [AU]

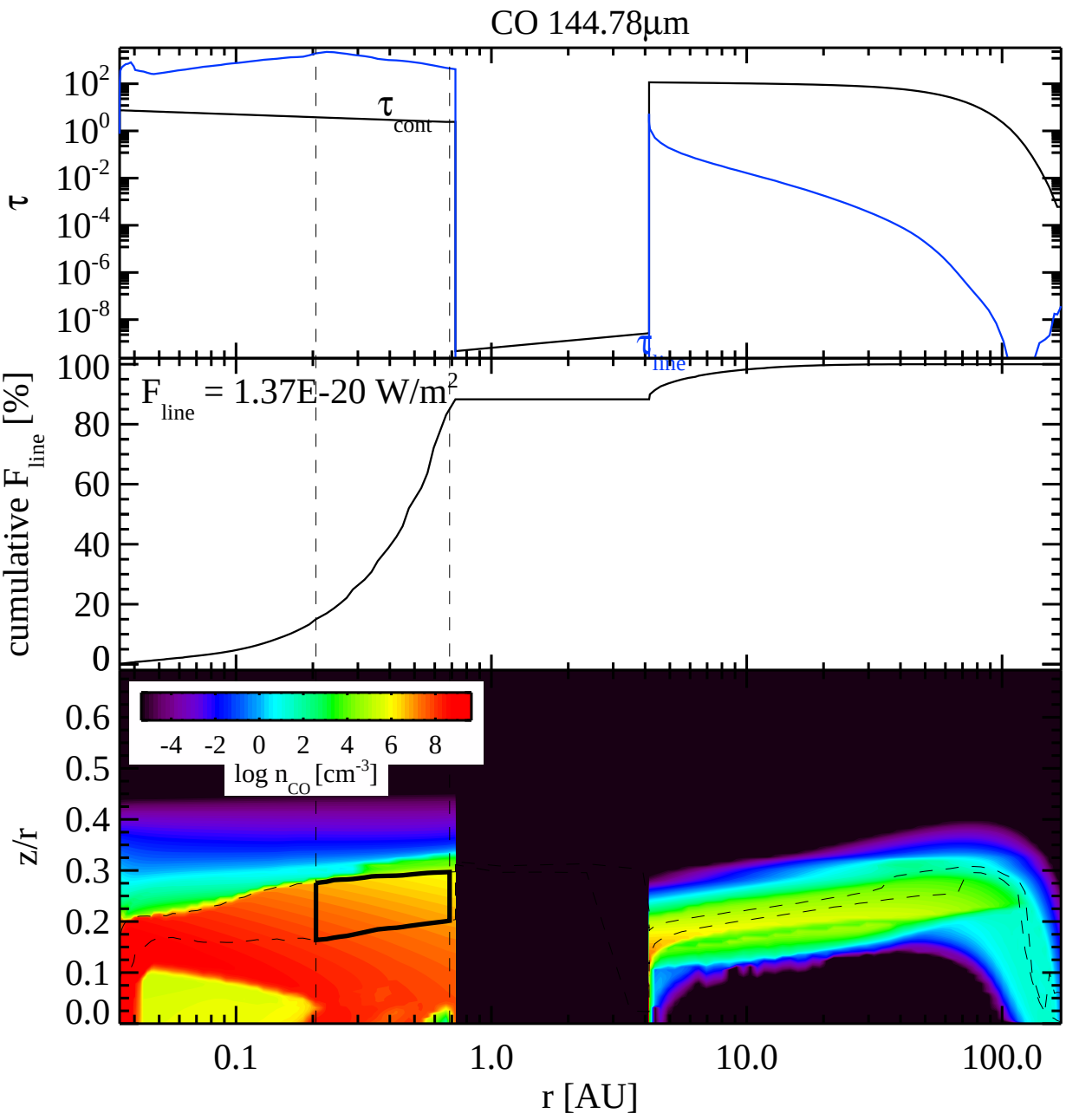

C17O 889.43µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 3.39E-21 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
50
100
150
r [AU]

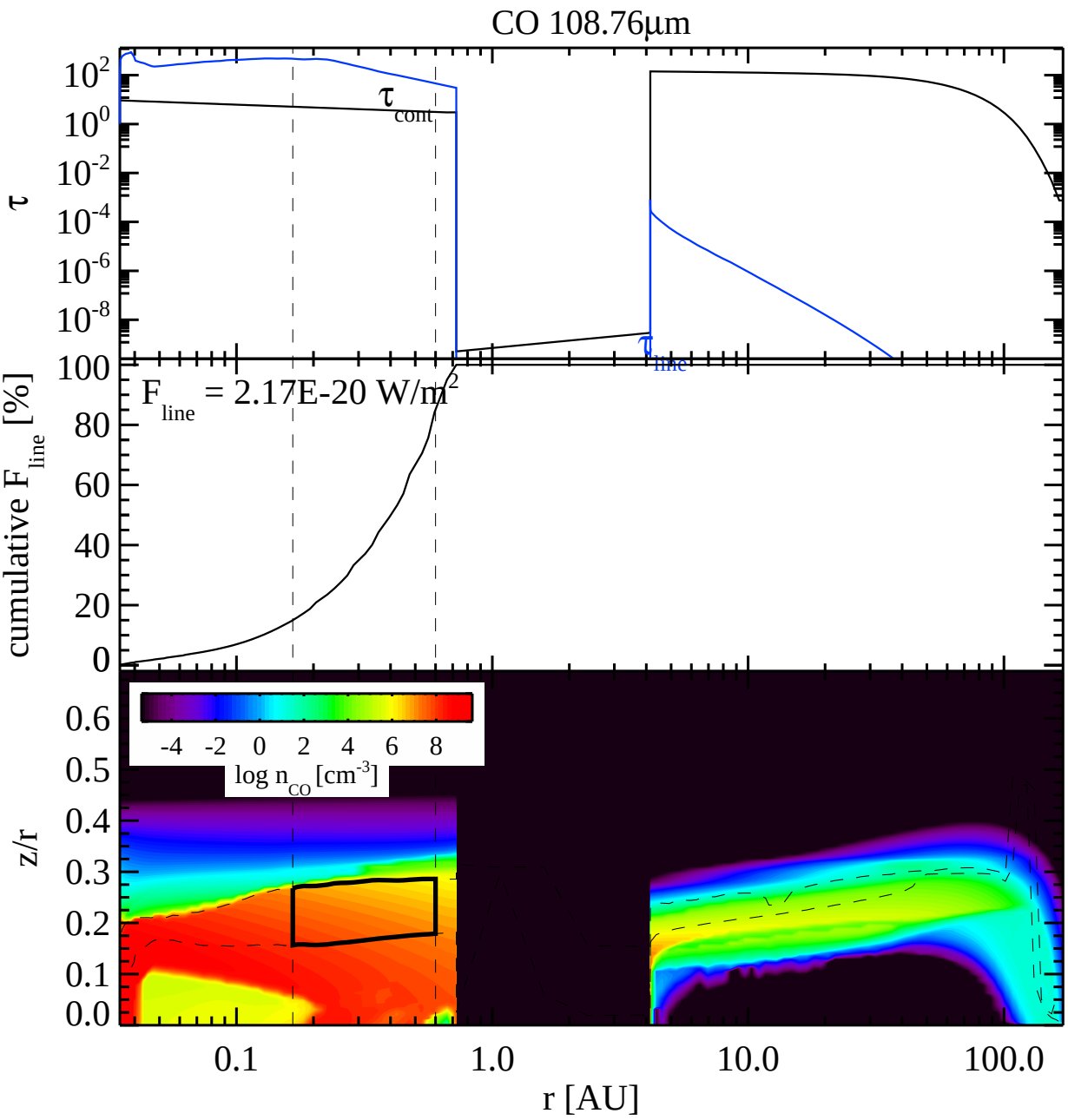

CO 520.23µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 2.46E-19 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

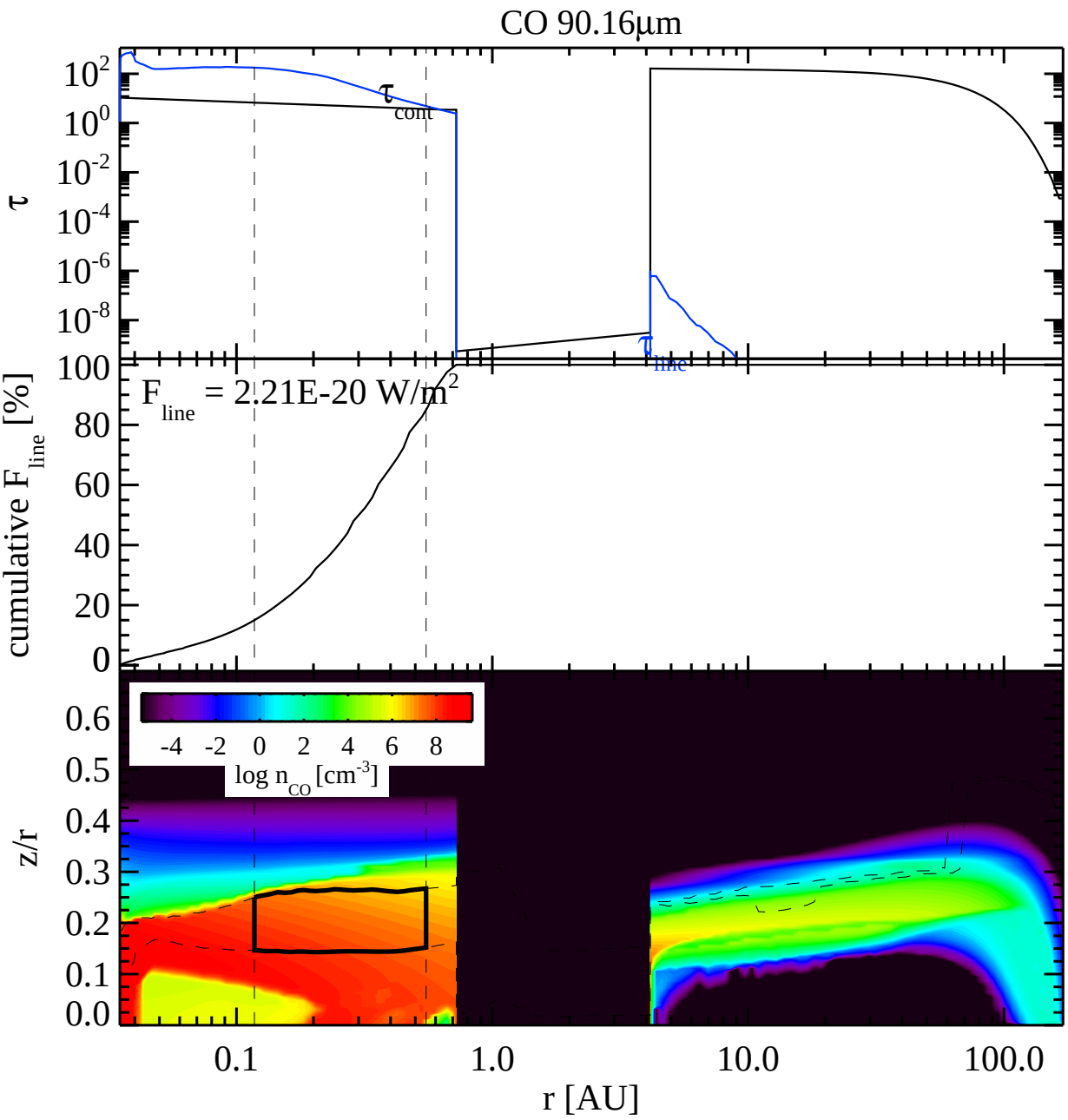

CO 433.56µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 3.44E-19 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

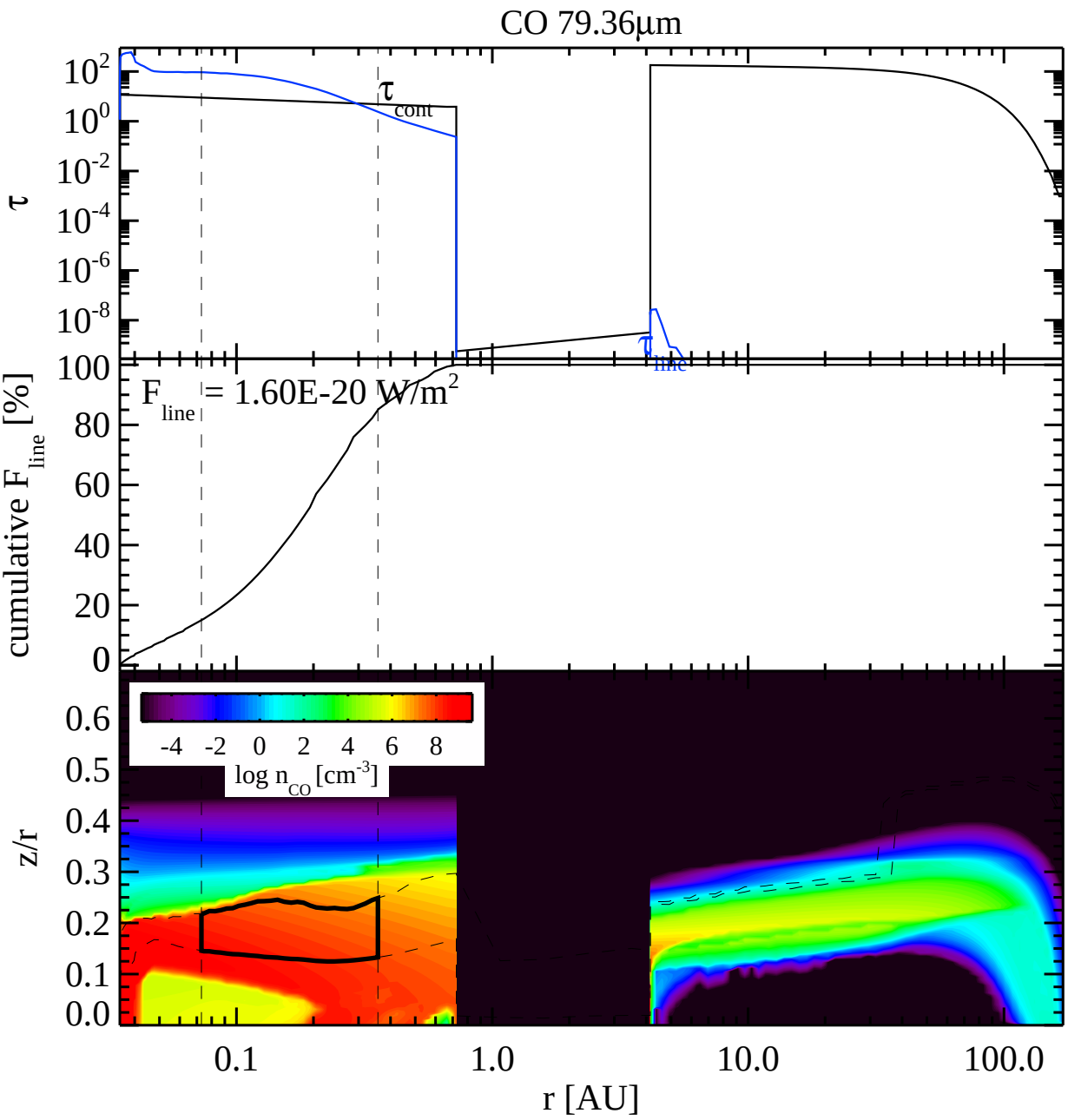

CO 260.24μm
τ
τ cont
τ line
cumulative F line [%]
F line = 4.61E-19 W/m2
log n CO [cm-3]
z/r
r [AU]

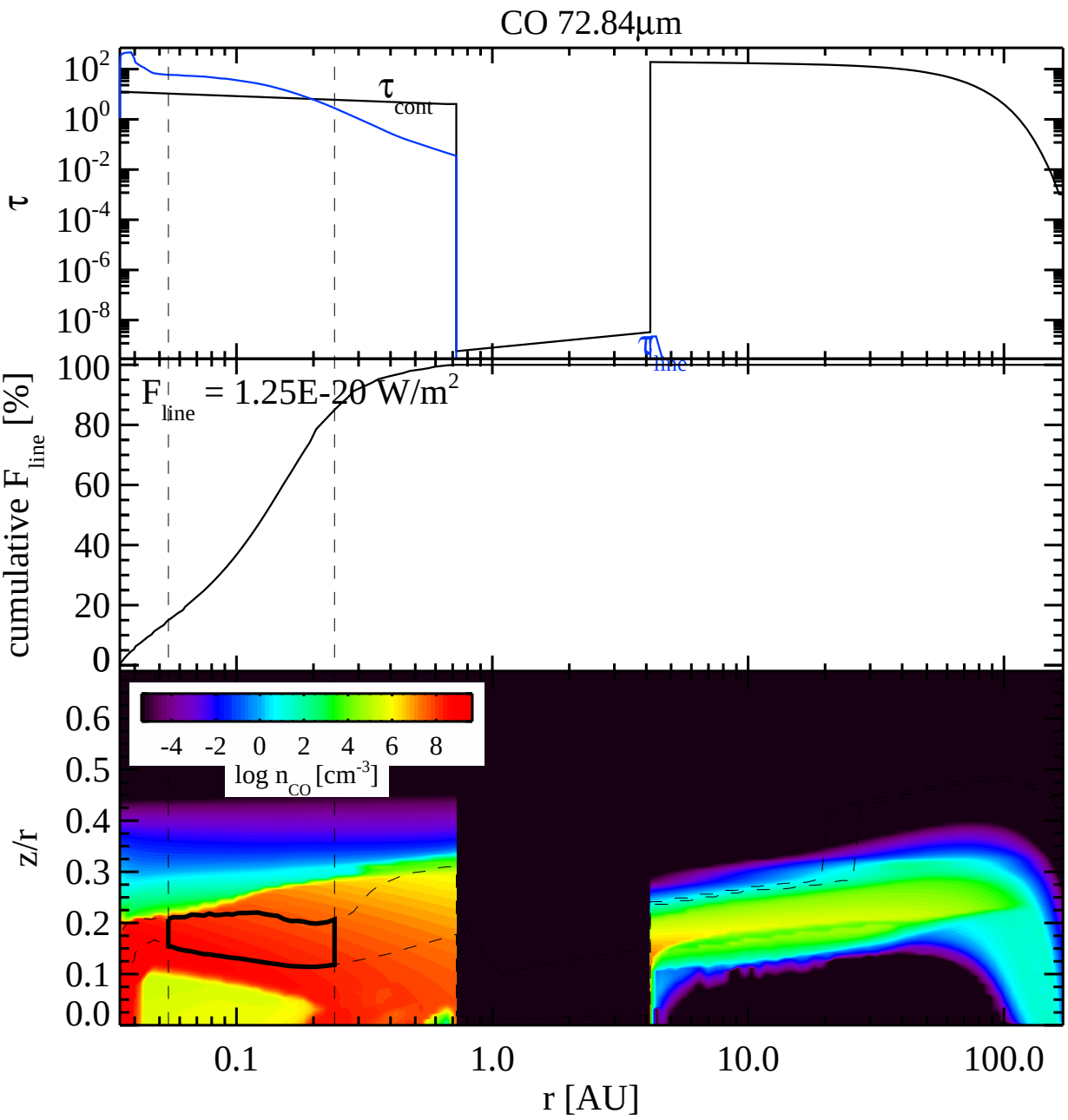

CO 186.00µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 7.39E-20 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

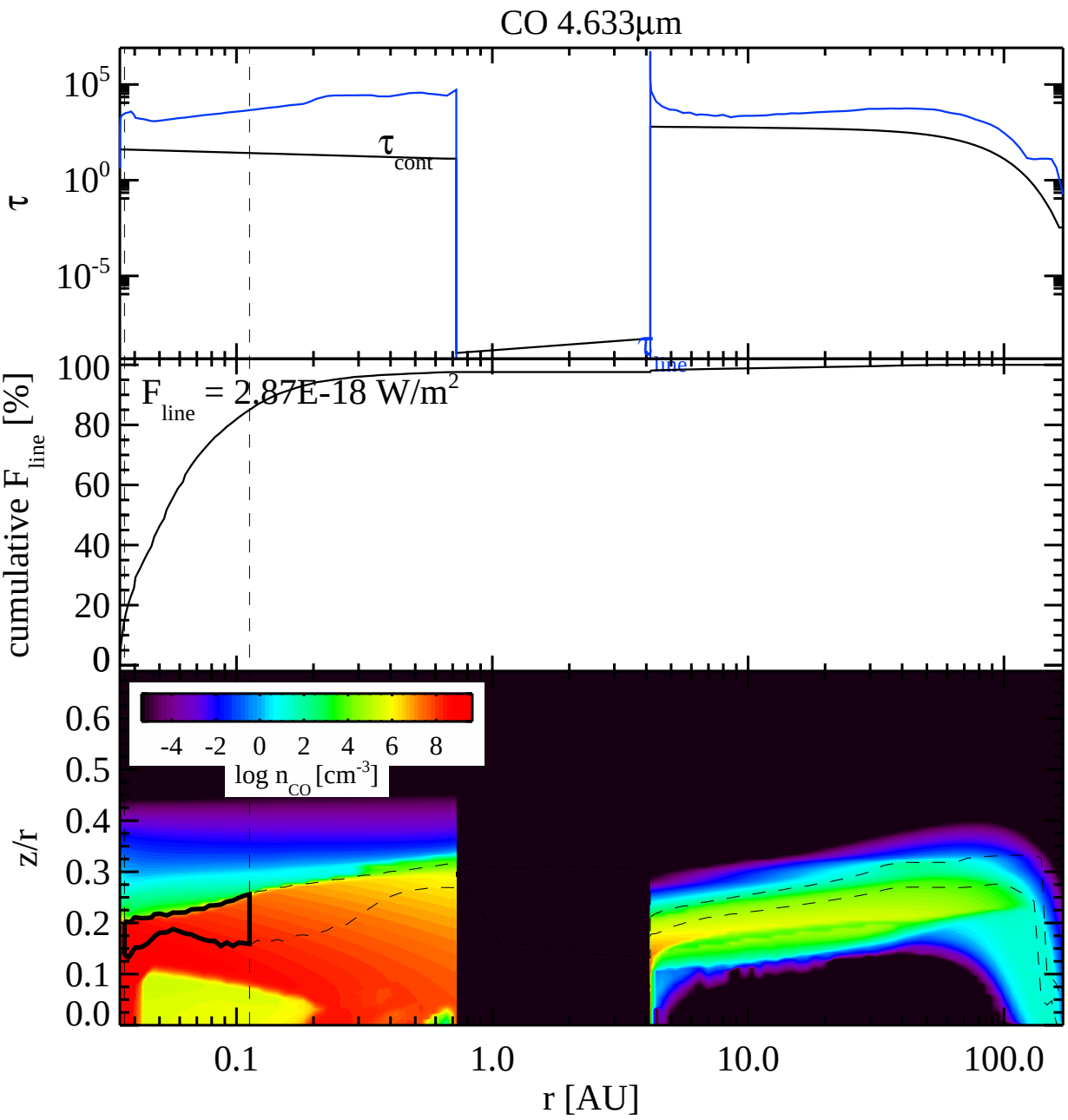

CO 144.78μm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.37E-20 W/m2
log n CO [cm-3]
z/r
r [AU]

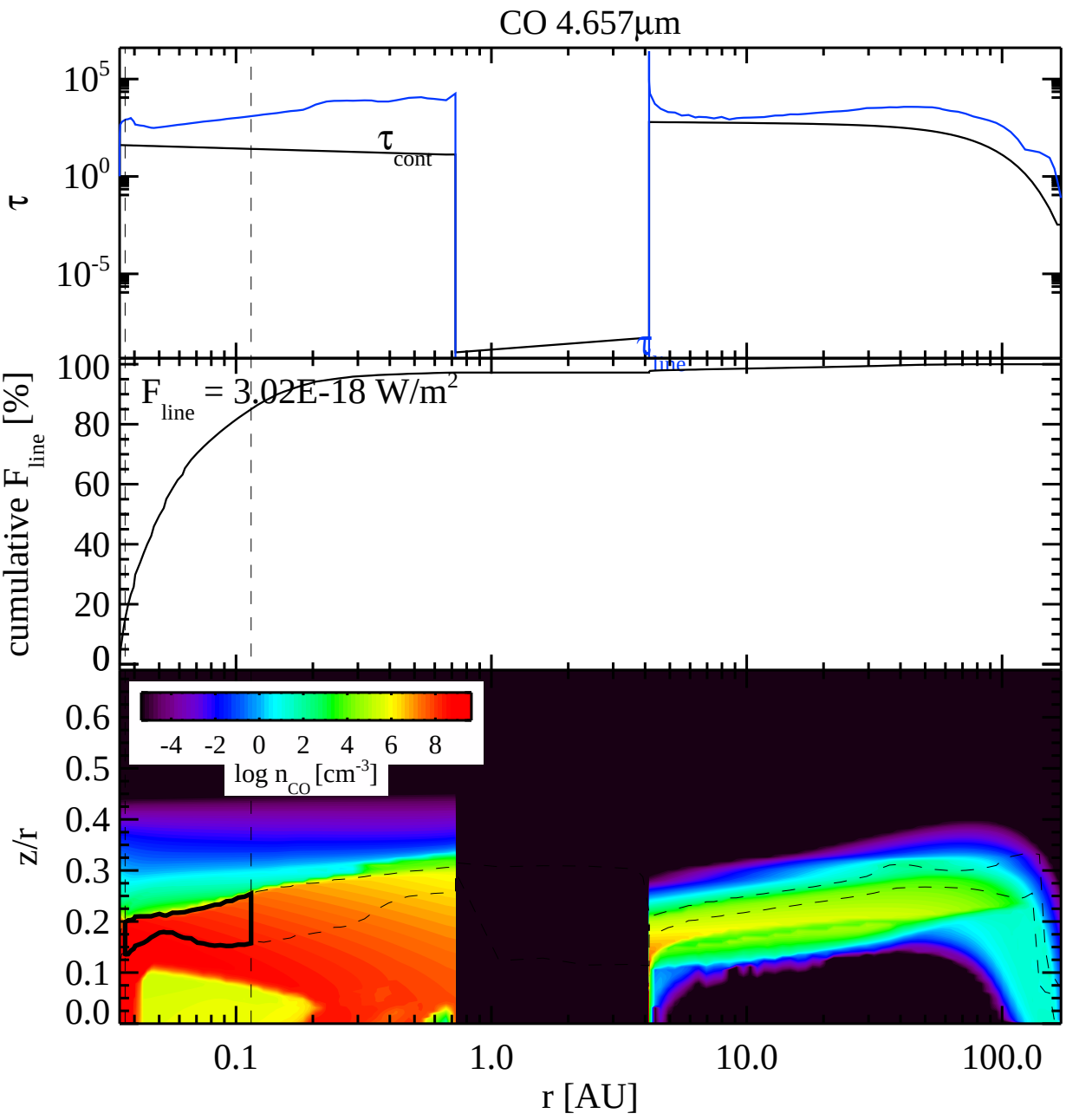

CO 108.76µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 2.17E-20 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

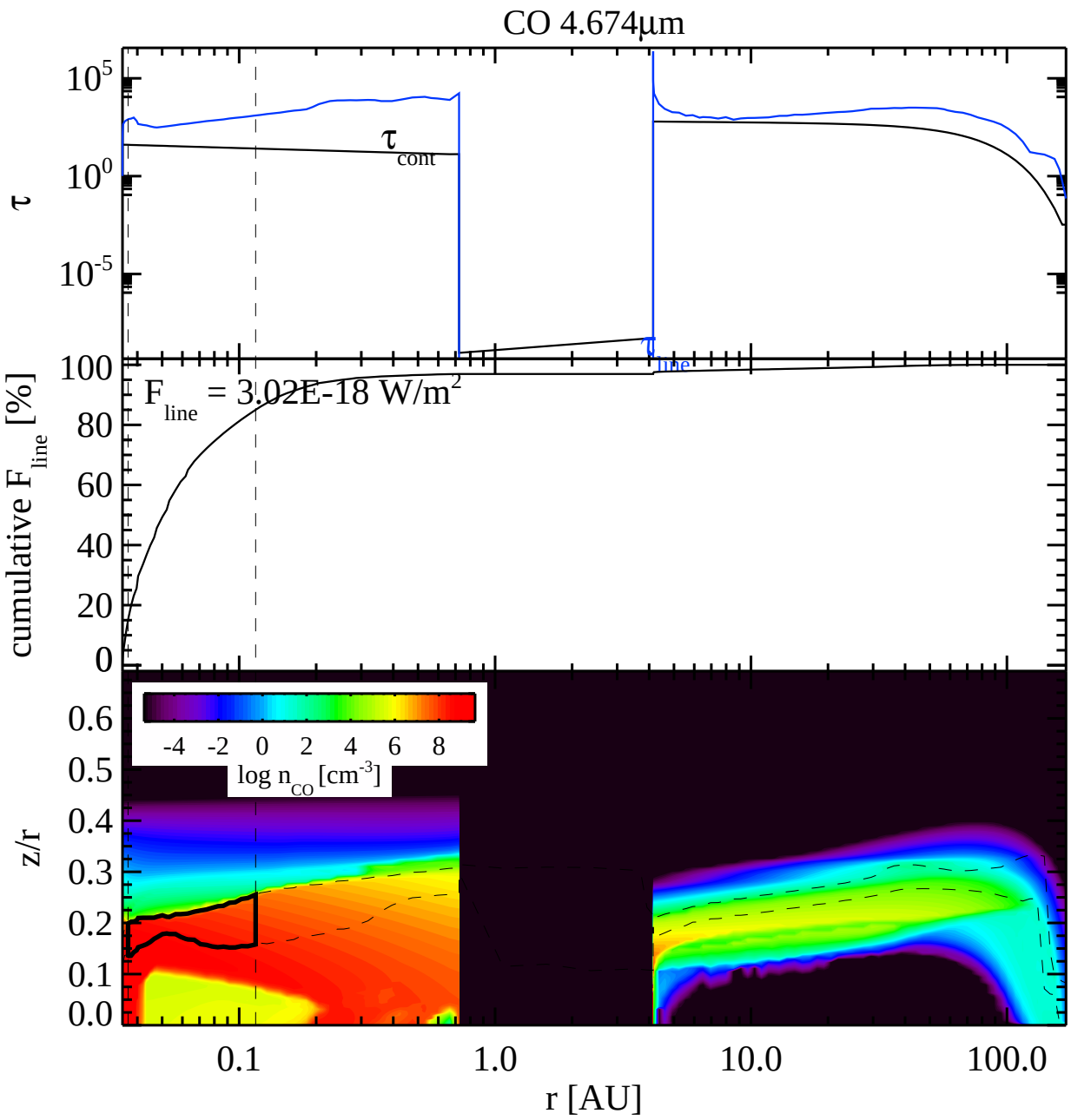

CO 90.16µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.21E-20 W/m^2
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

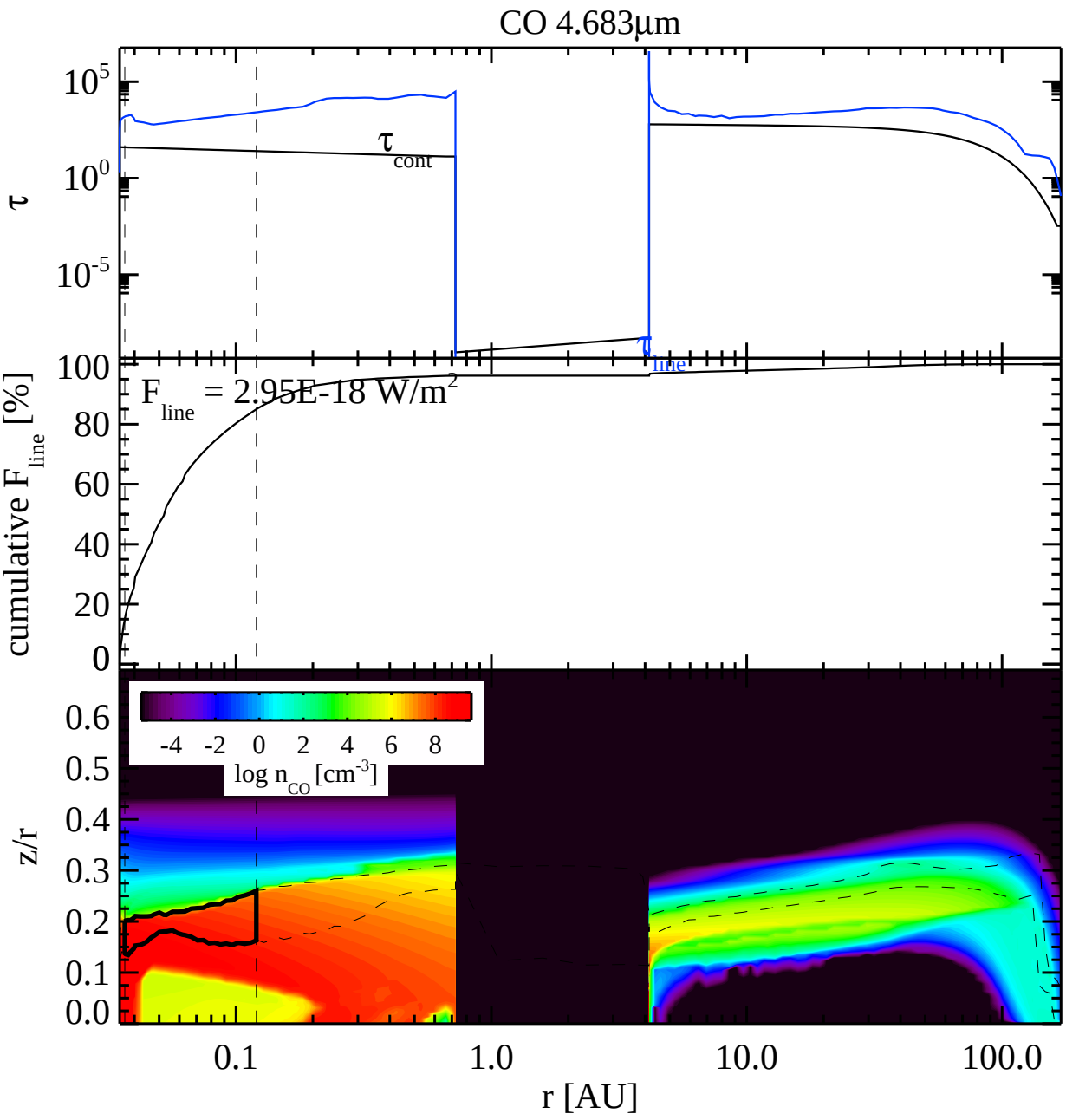

CO 79.36µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.60E-20 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

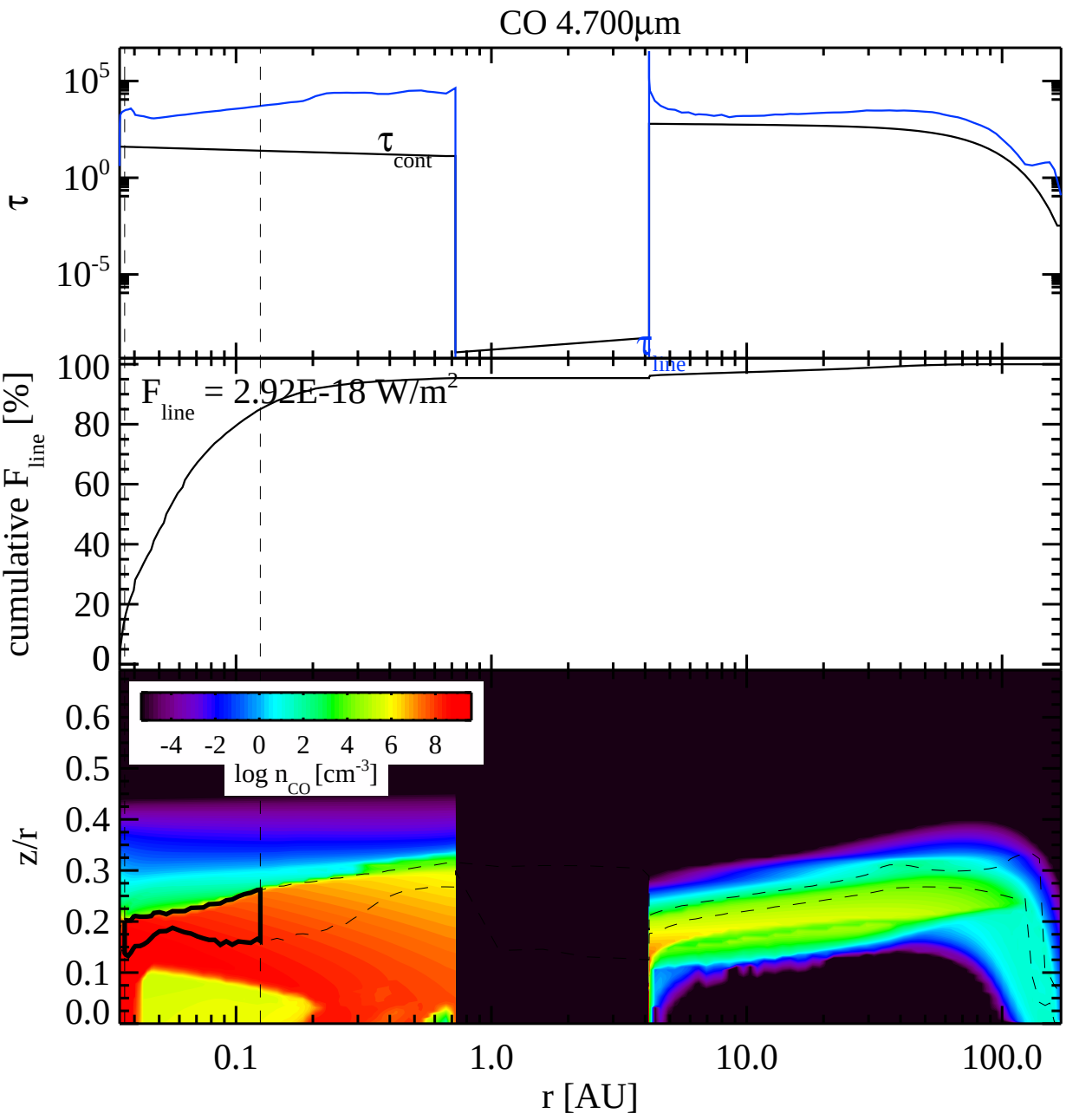

CO 72.84µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.25E-20 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

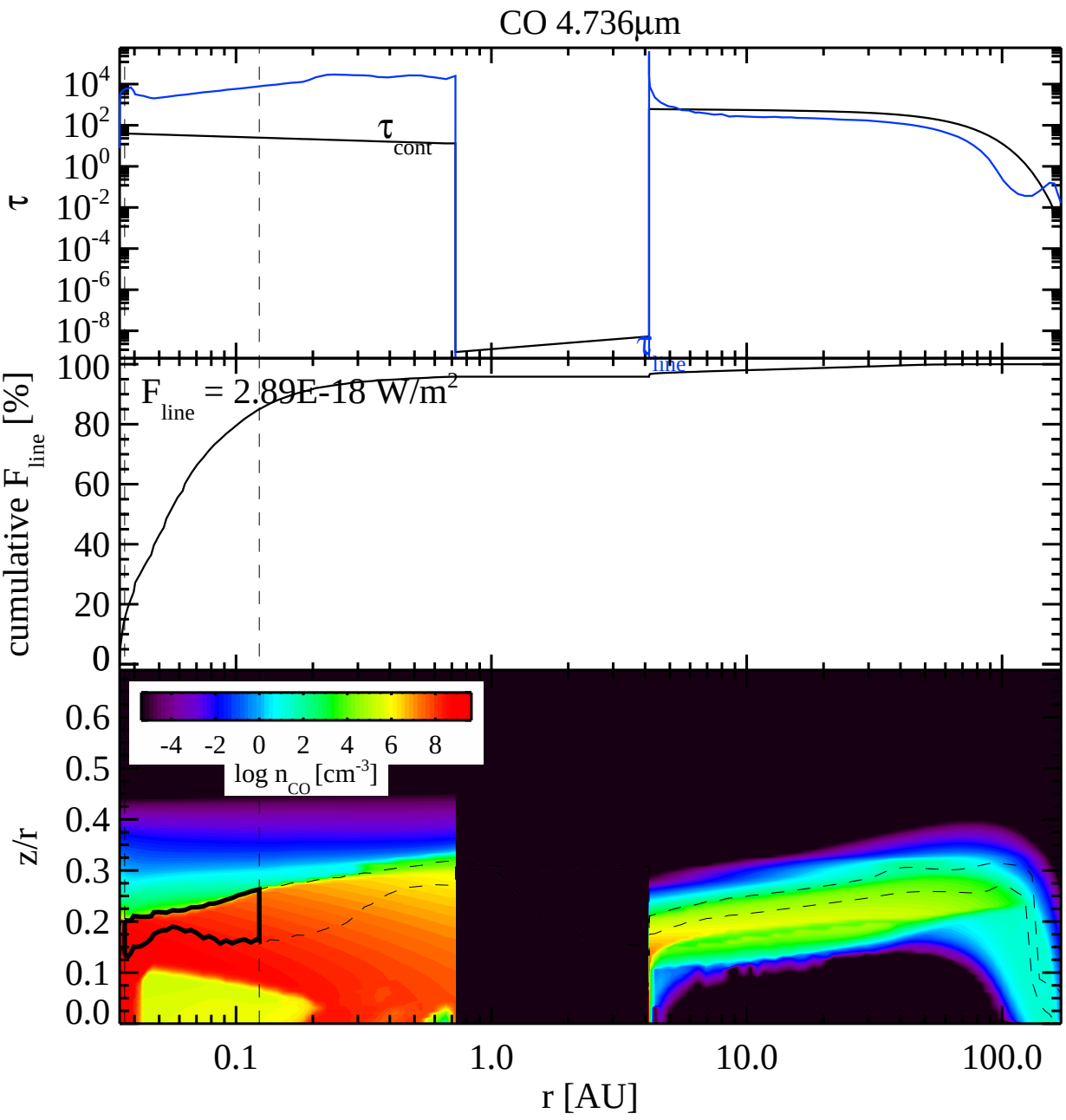

CO 4.633µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.87E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

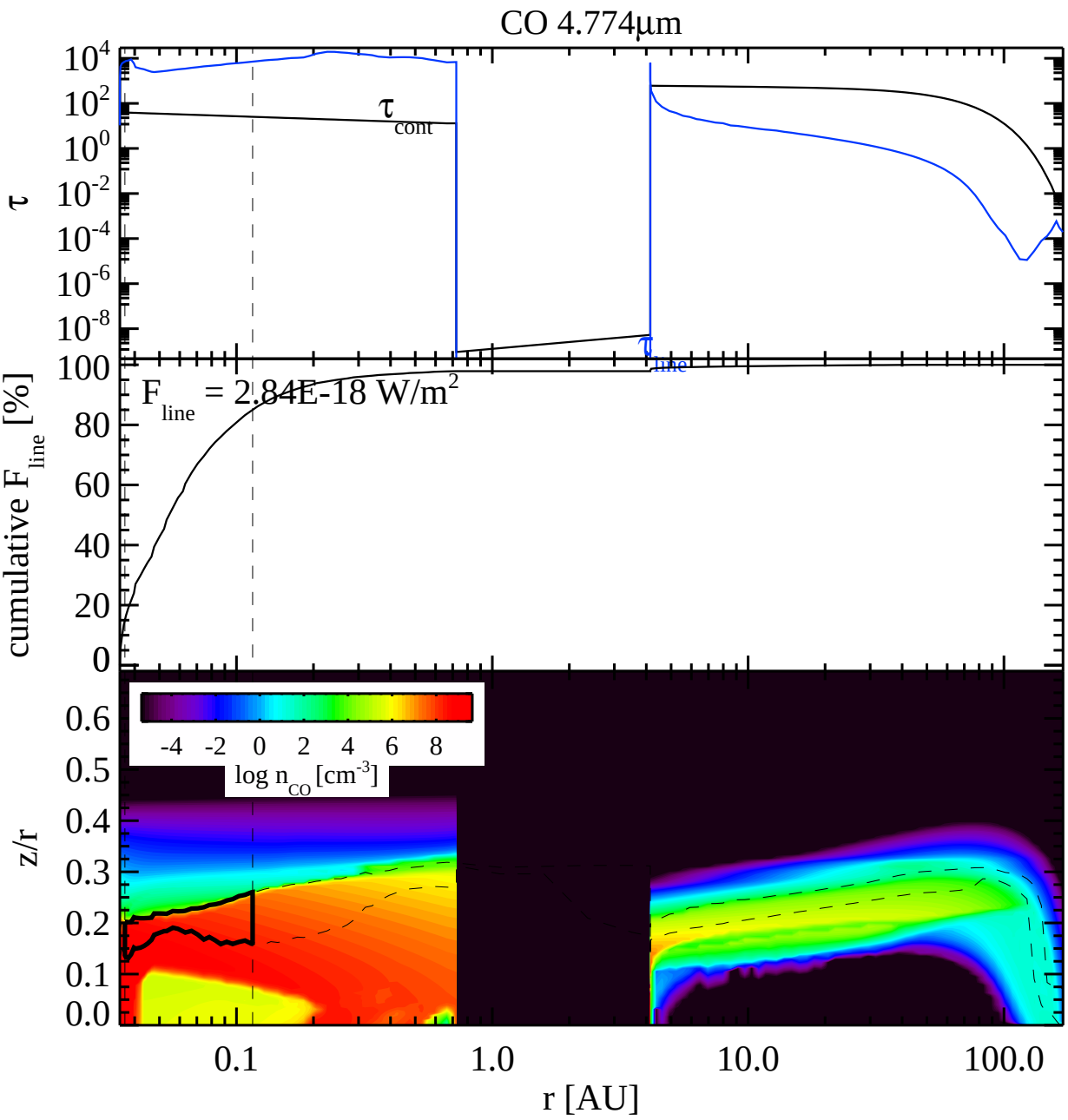

CO 4.657µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 3.02E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

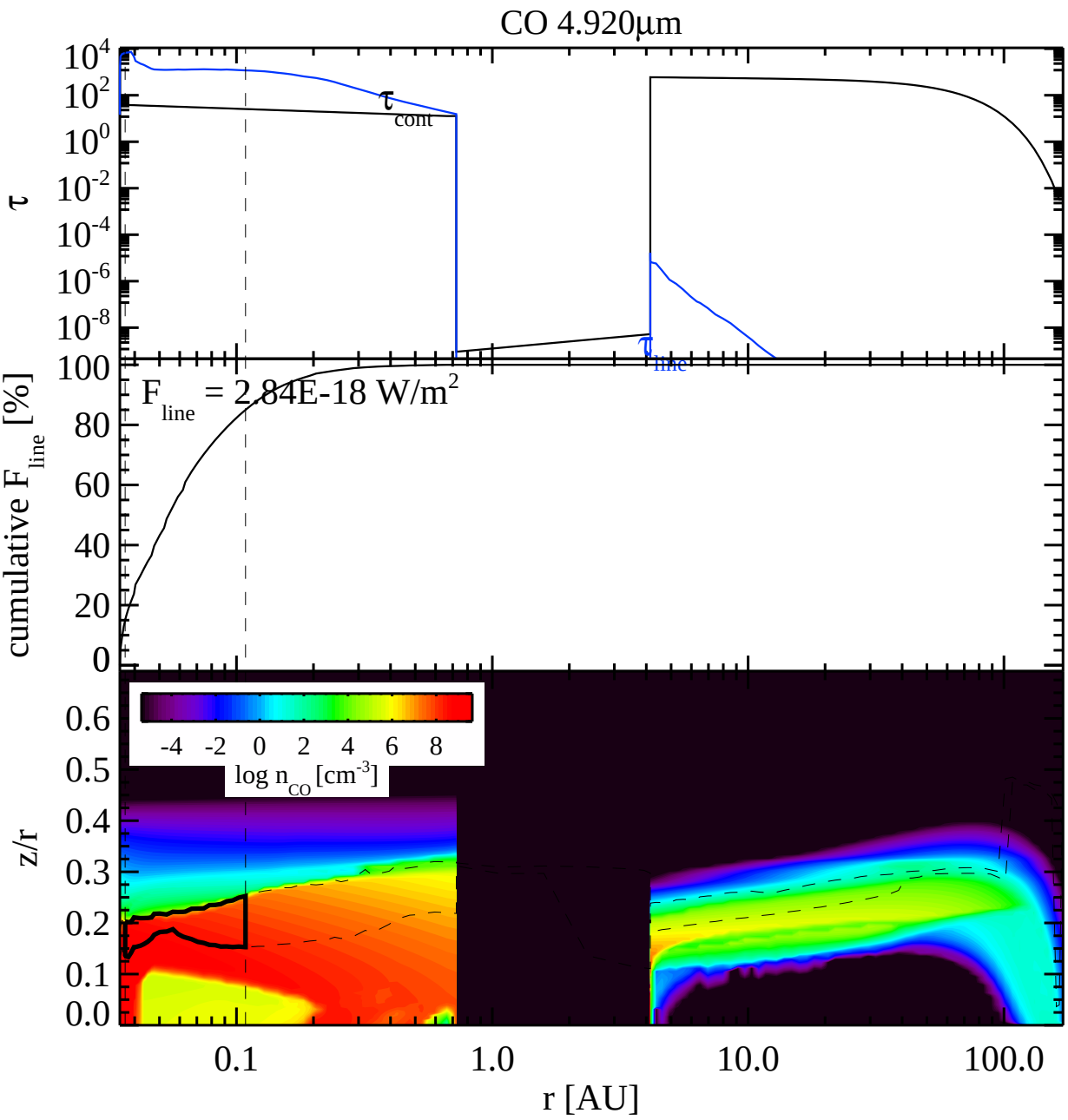

CO 4.674µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 3.02E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

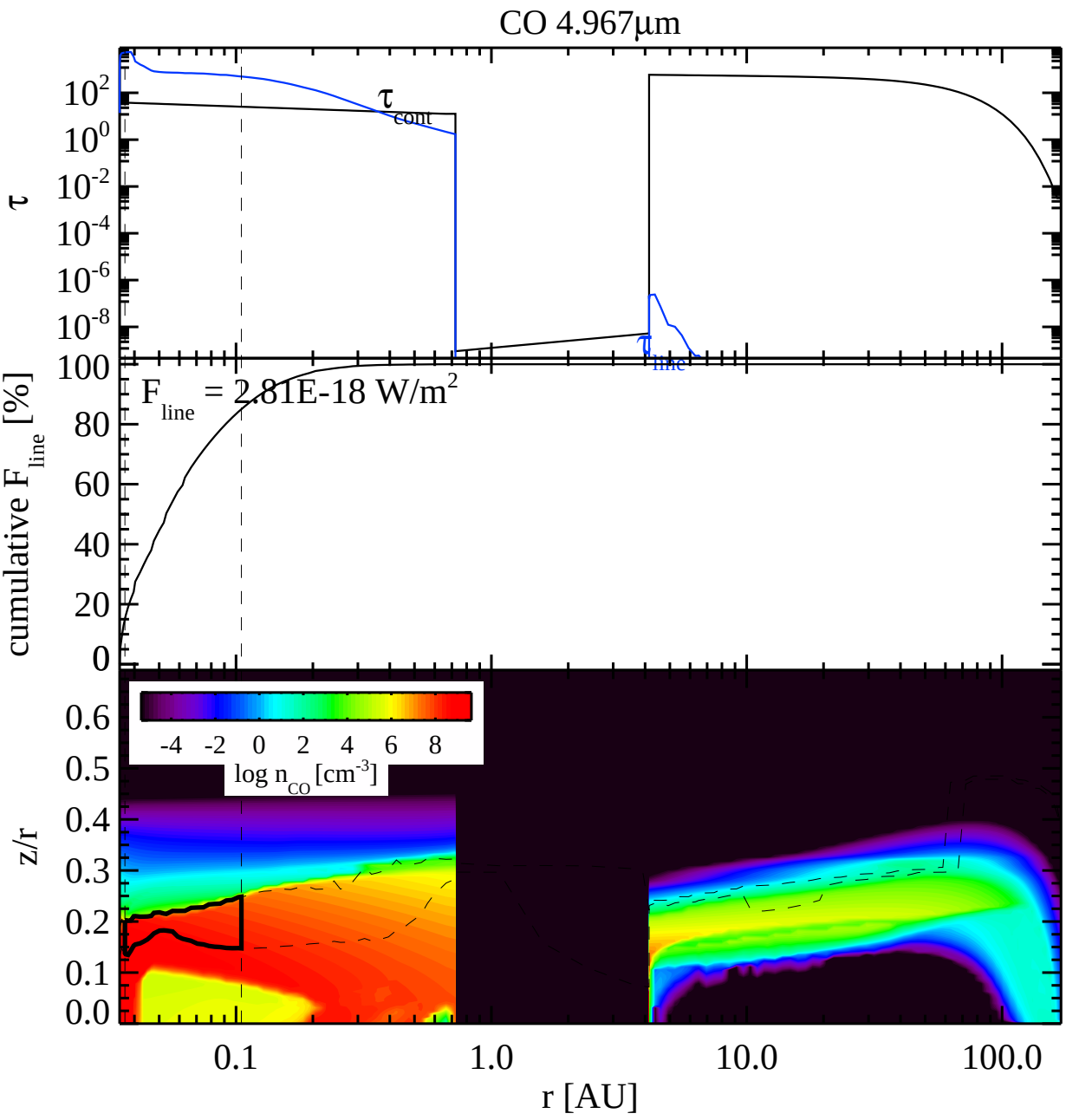

CO 4.683µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.95E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

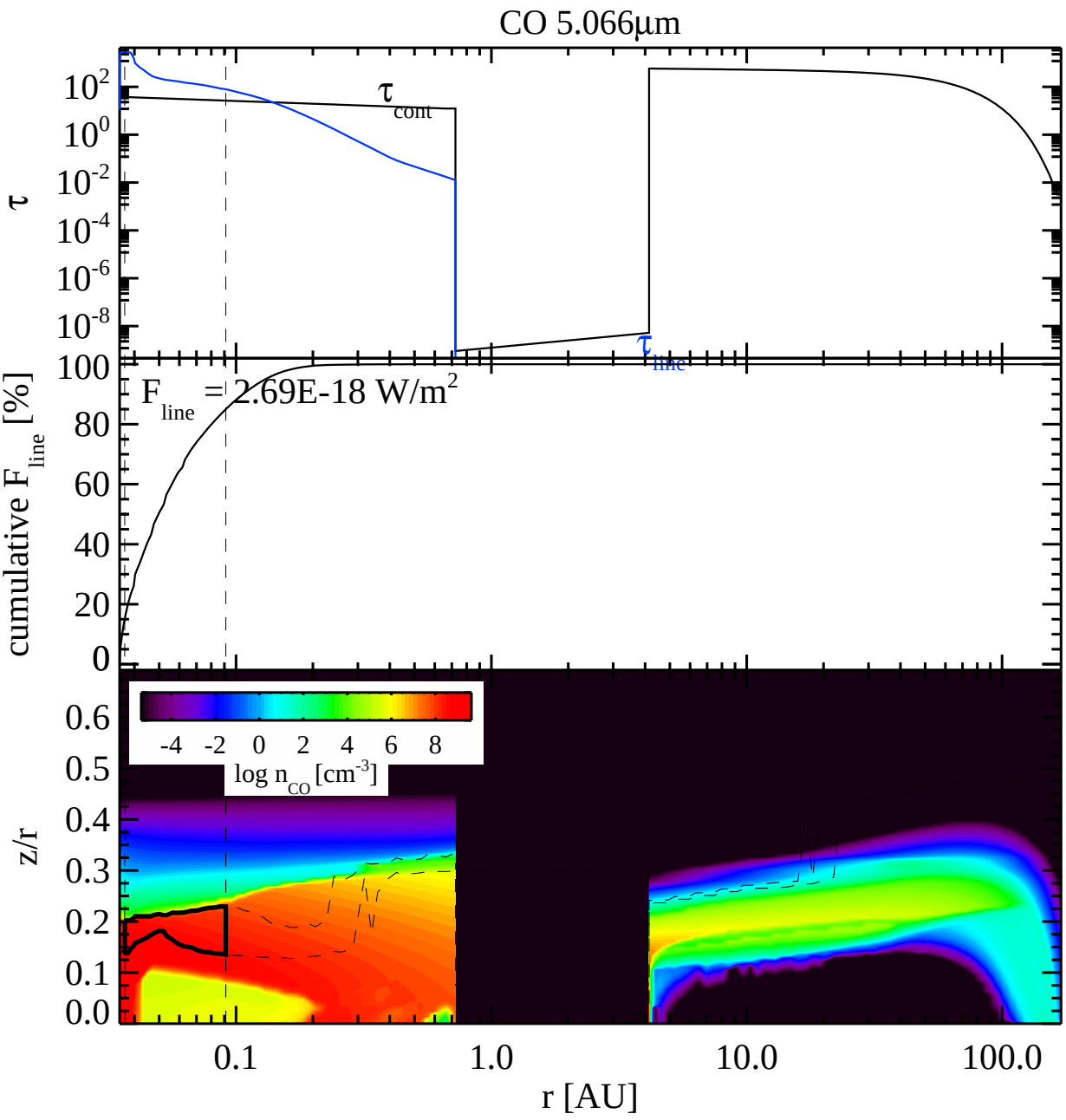

CO 4.700µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.92E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

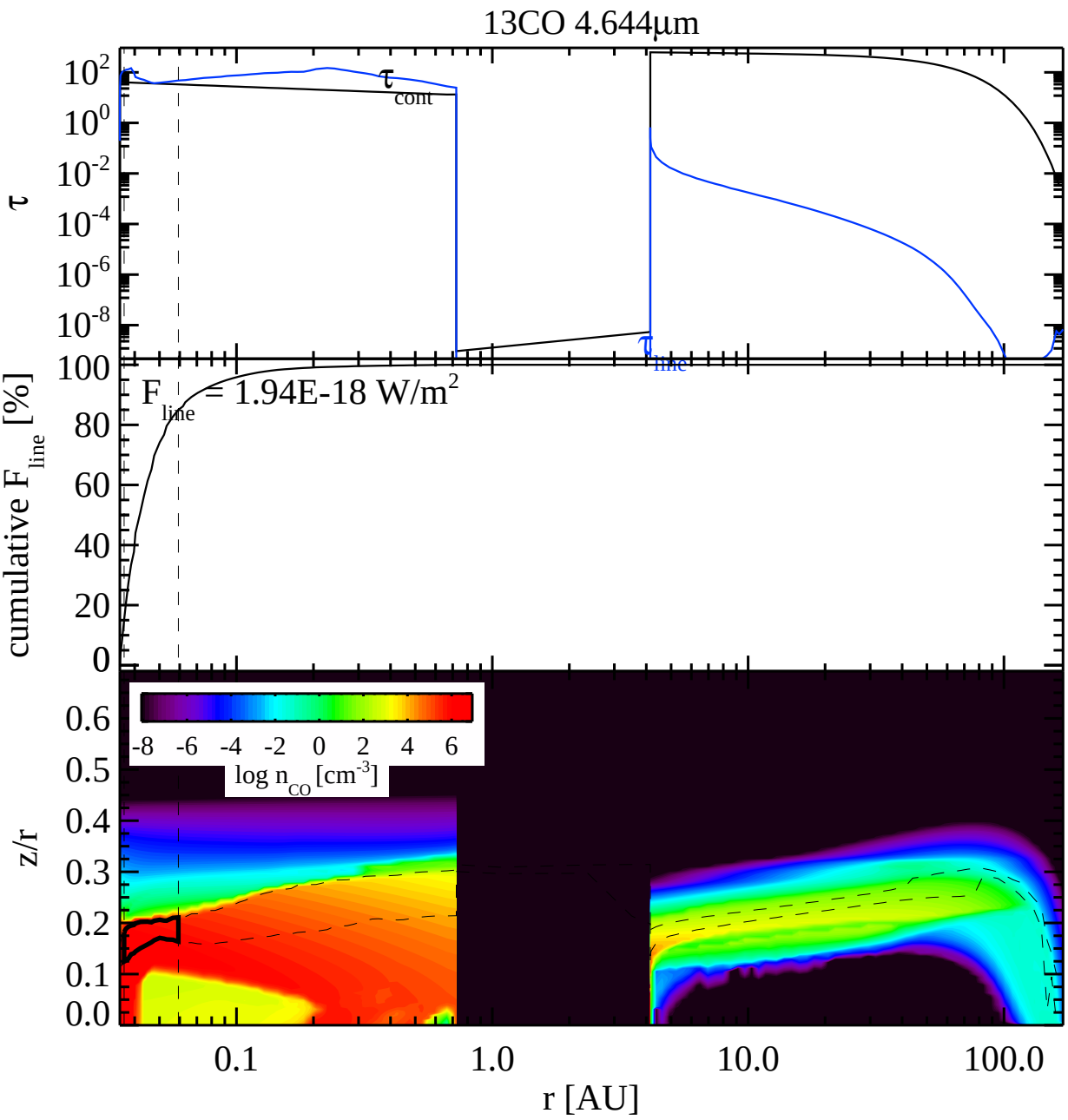

CO 4.736µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.89E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

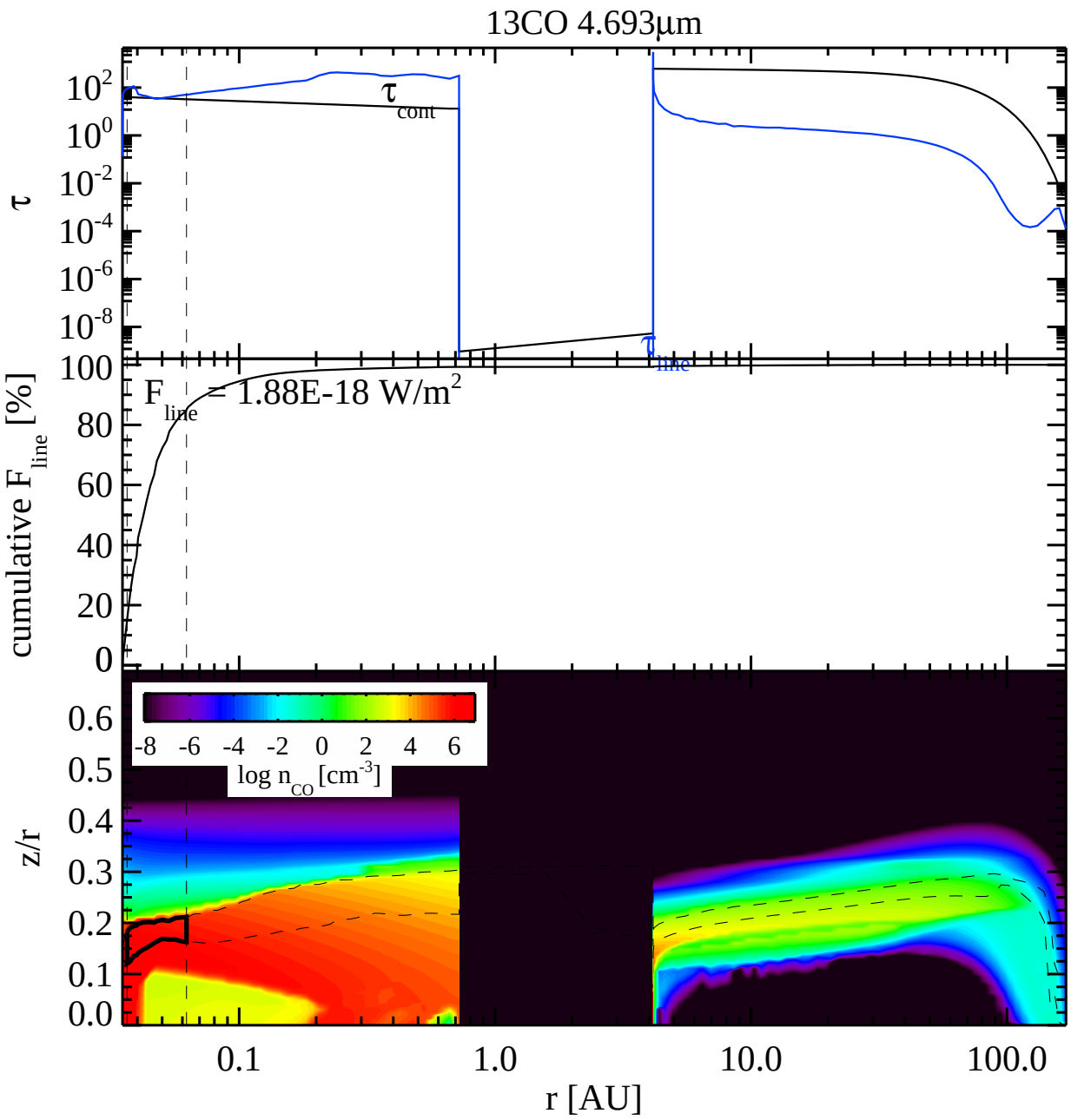

CO 4.774µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.84E-18 W/m2
z/r
log n CO [cm-3]
-4 -2 0 2 4 6 8
r [AU]
0.1
1.0
10.0
100.0

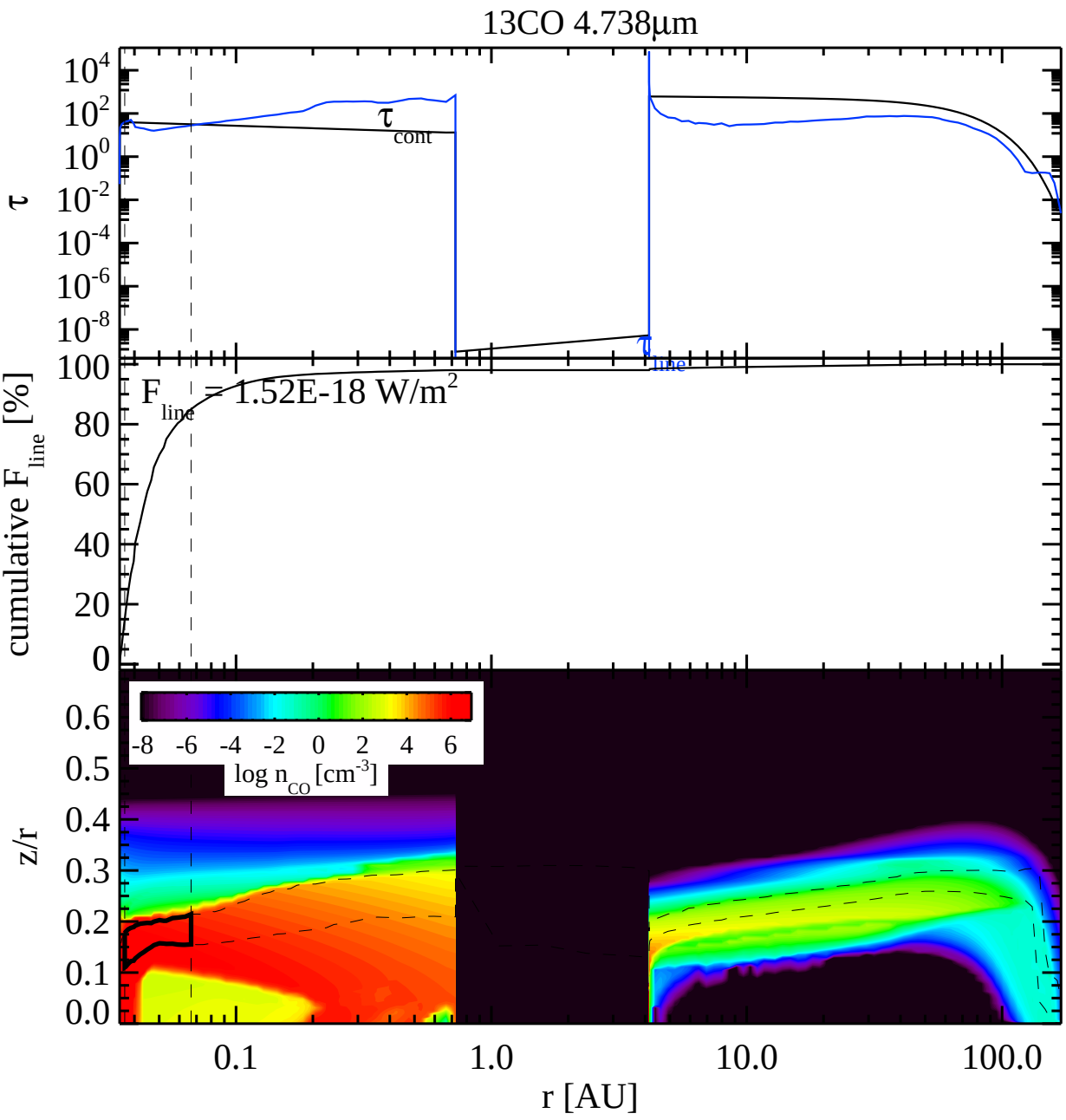

CO 4.920µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.84E-18 W/m2
log n CO [cm-3]
-4 -2 0 2 4 6 8
z/r
r [AU]
0.1
1.0
10.0
100.0

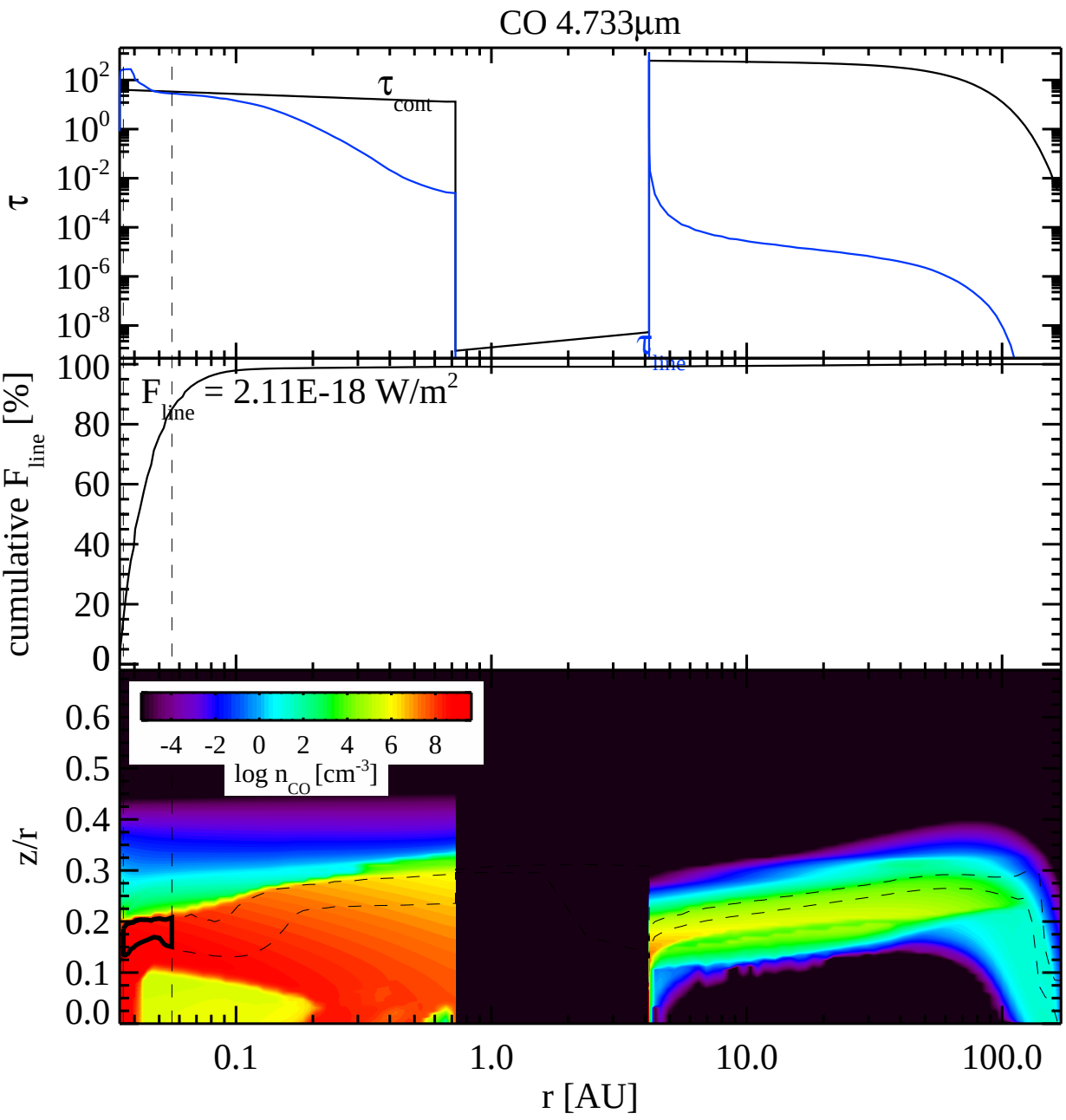

CO 4.967µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.81E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

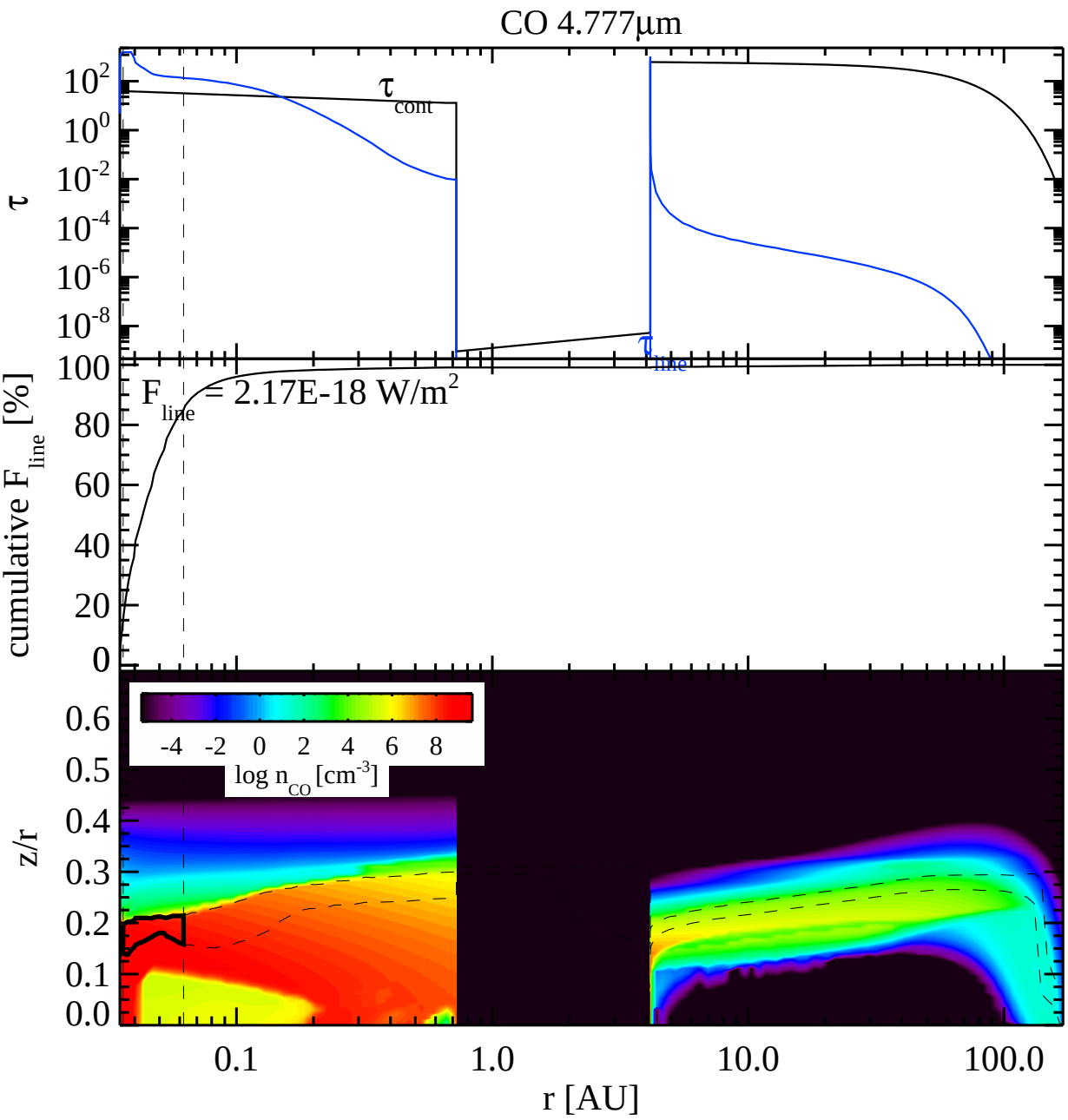

CO 5.066µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.69E-18 W/m^2
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

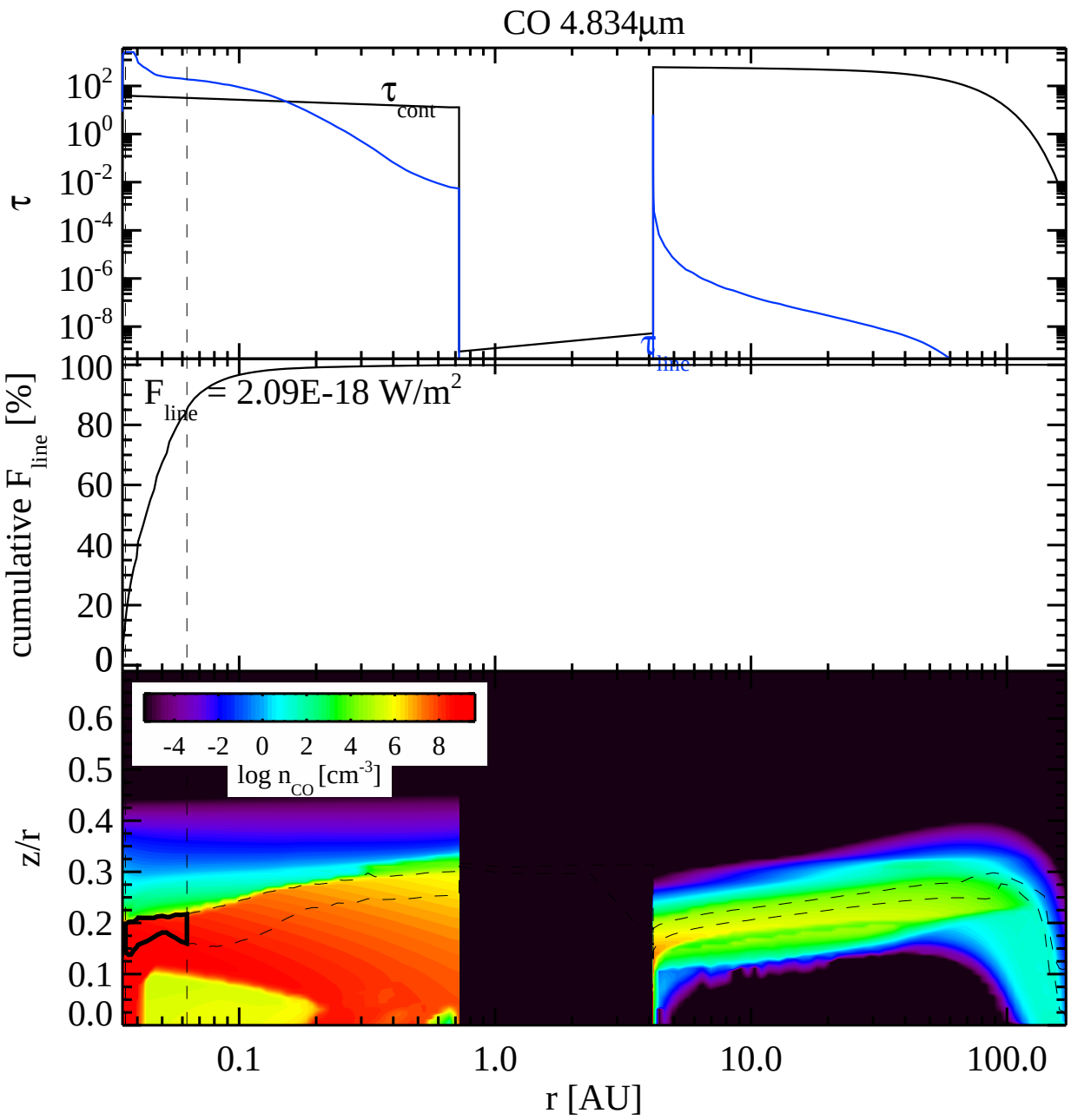

13CO 4.644µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.94E-18 W/m2
z/r
log n CO [cm-3]
-8 -6 -4 -2 0 2 4 6
r [AU]
0.1
1.0
10.0
100.0

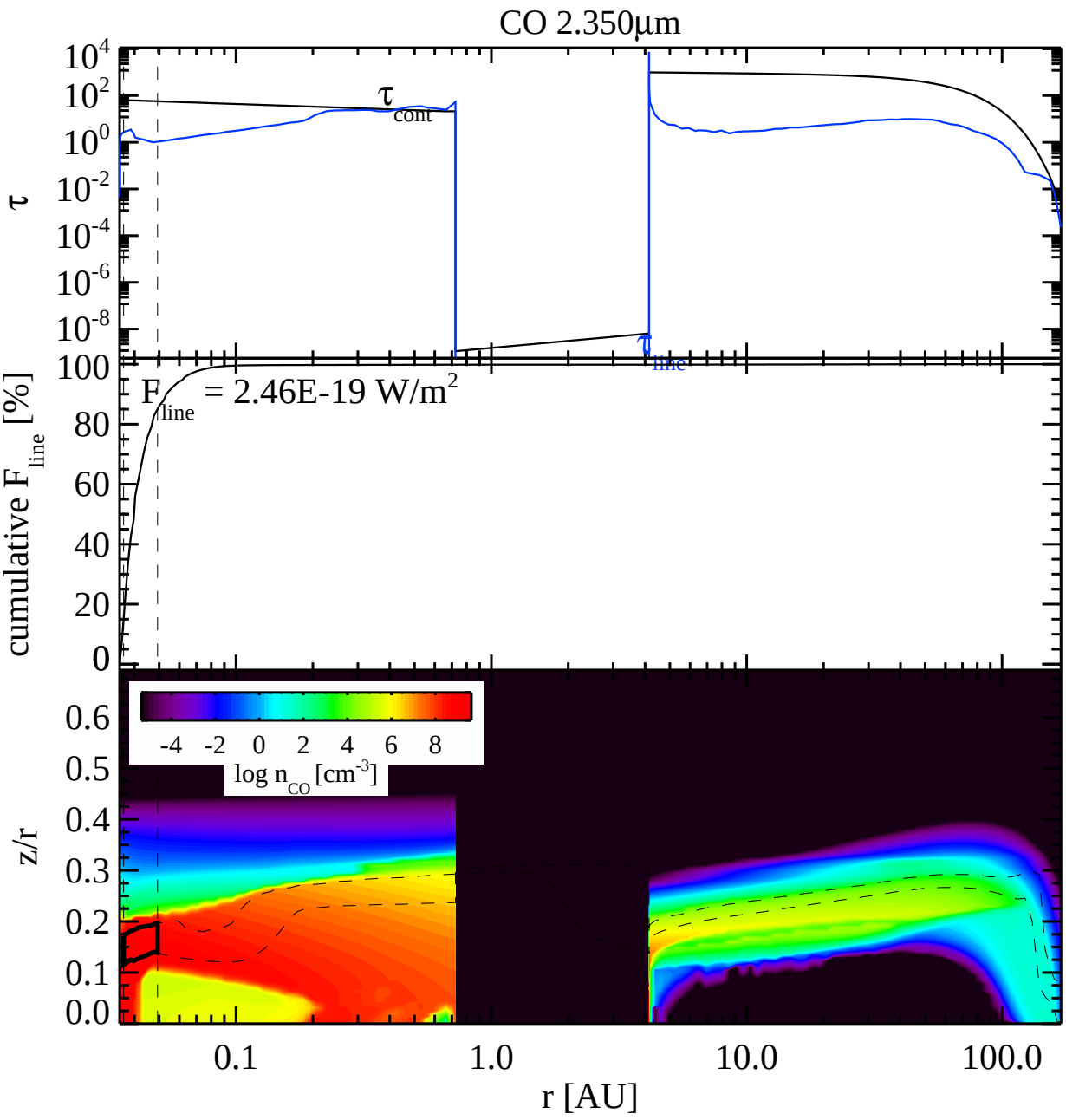

13CO 4.693µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.88E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

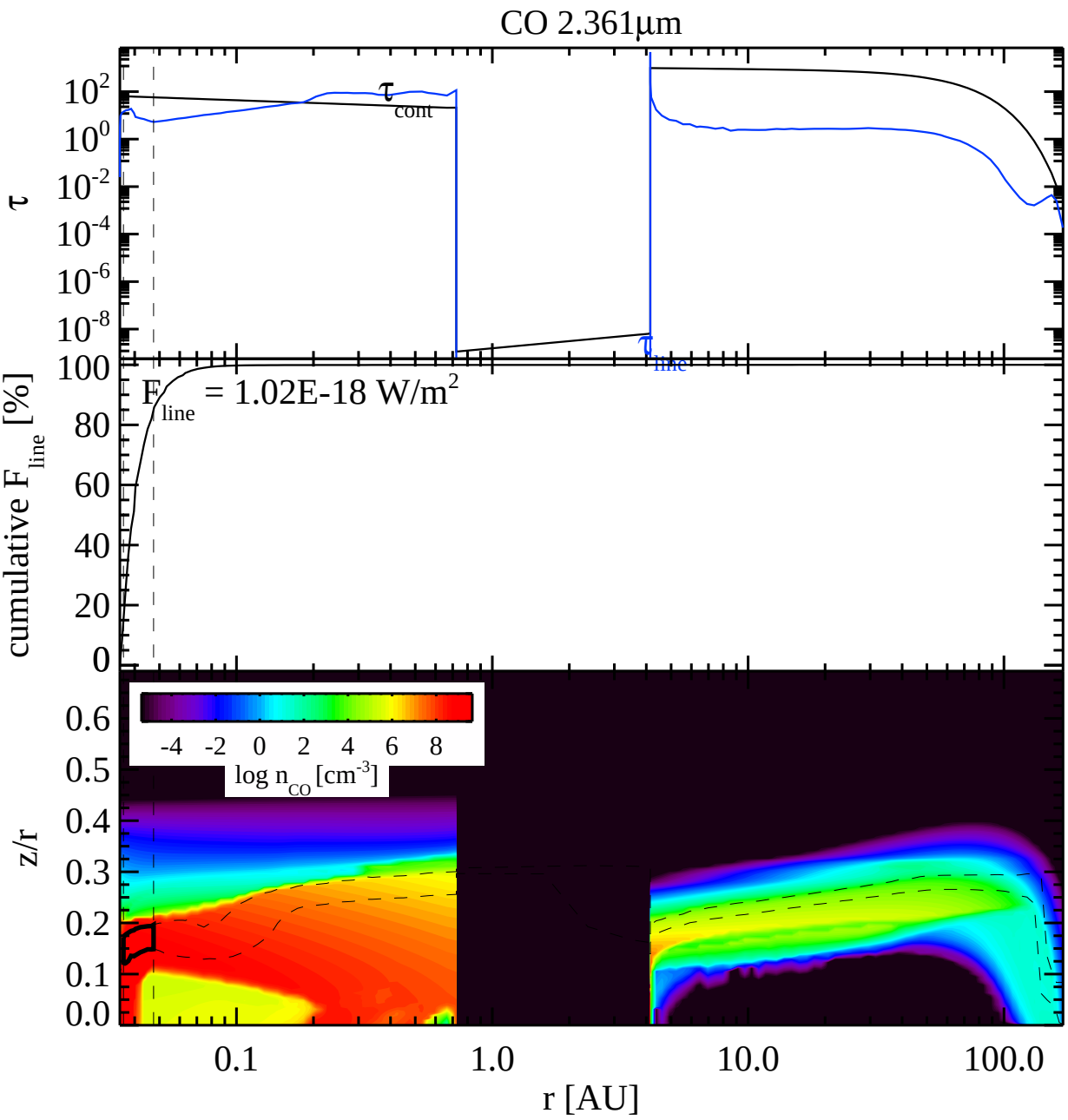

13CO 4.738µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.52E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4 6
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

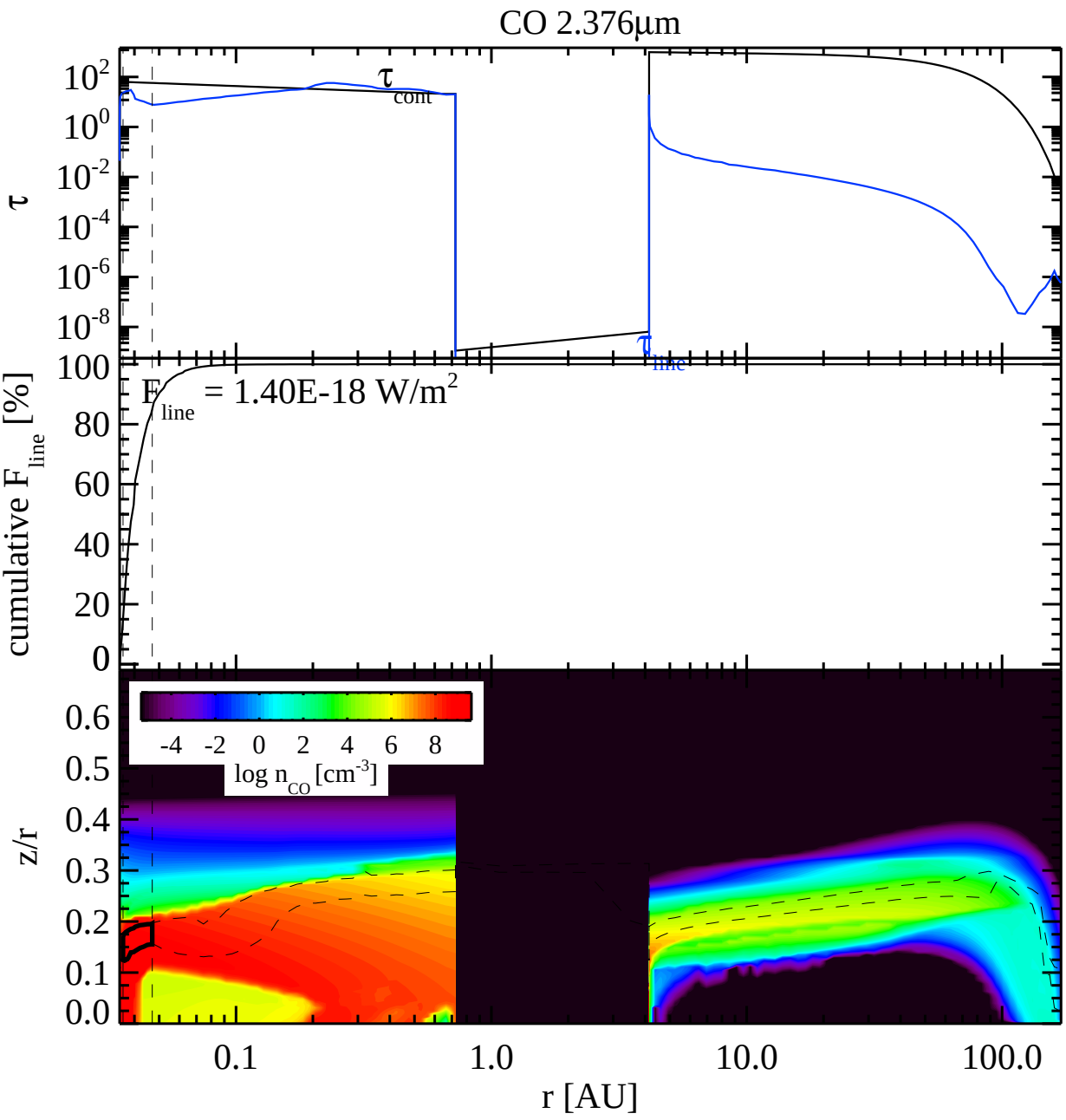

CO 4.733µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.11E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

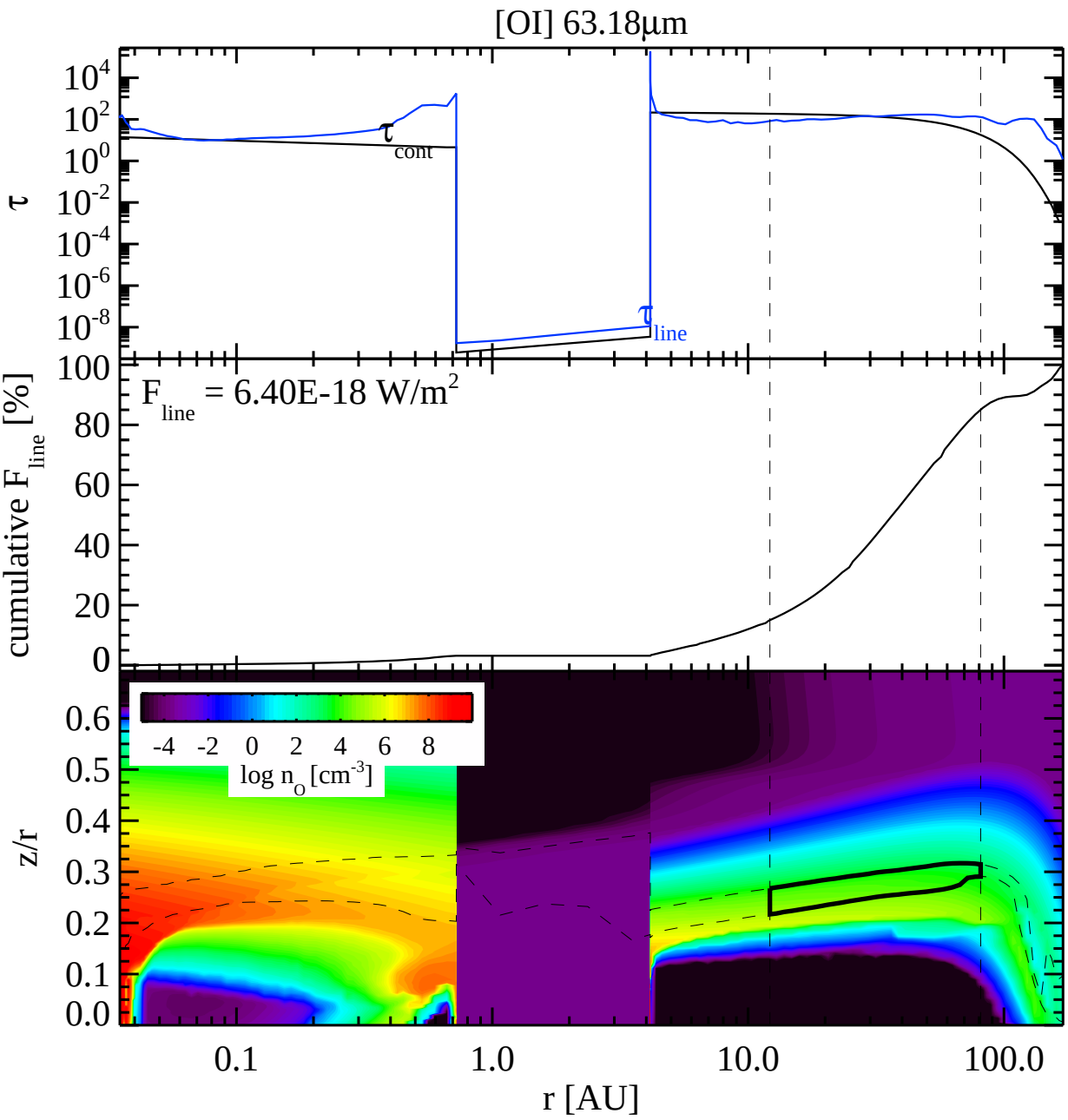

CO 4.777µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.17E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

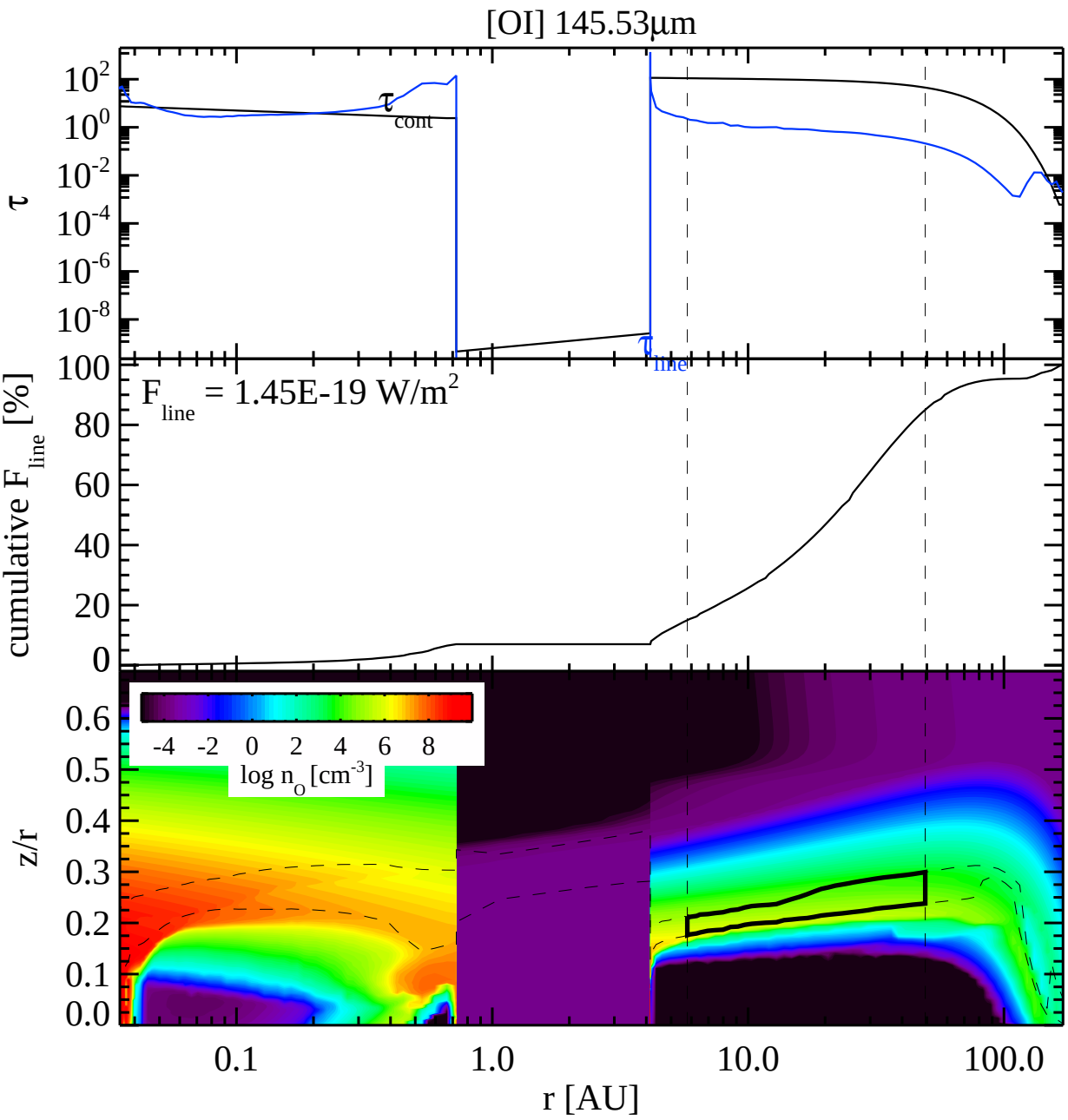

CO 4.834μm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 2.09E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

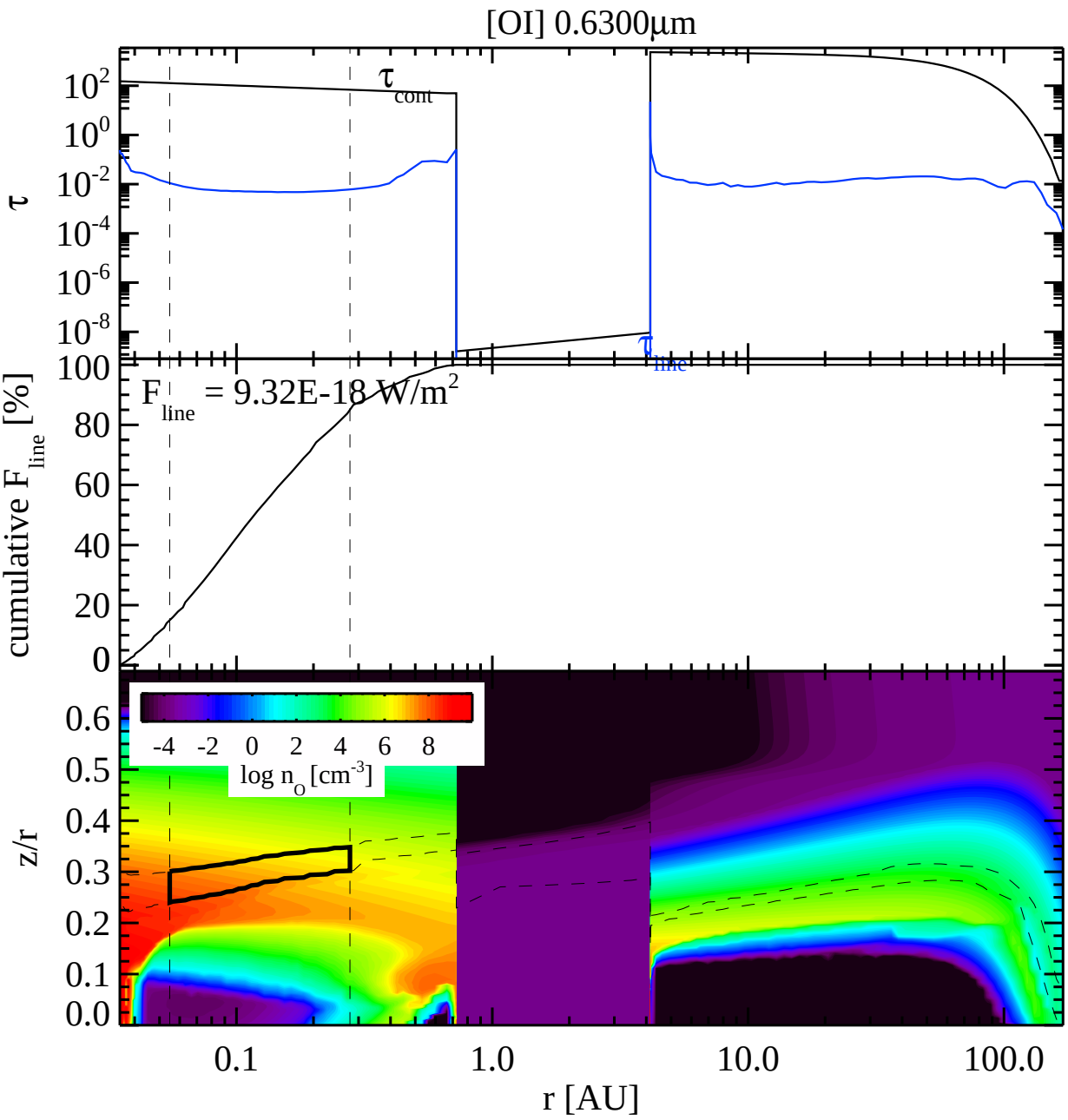

CO 2.350µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.46E-19 W/m2
z/r
log n CO [cm-3]
-4 -2 0 2 4 6 8
r [AU]
0.1
1.0
10.0
100.0

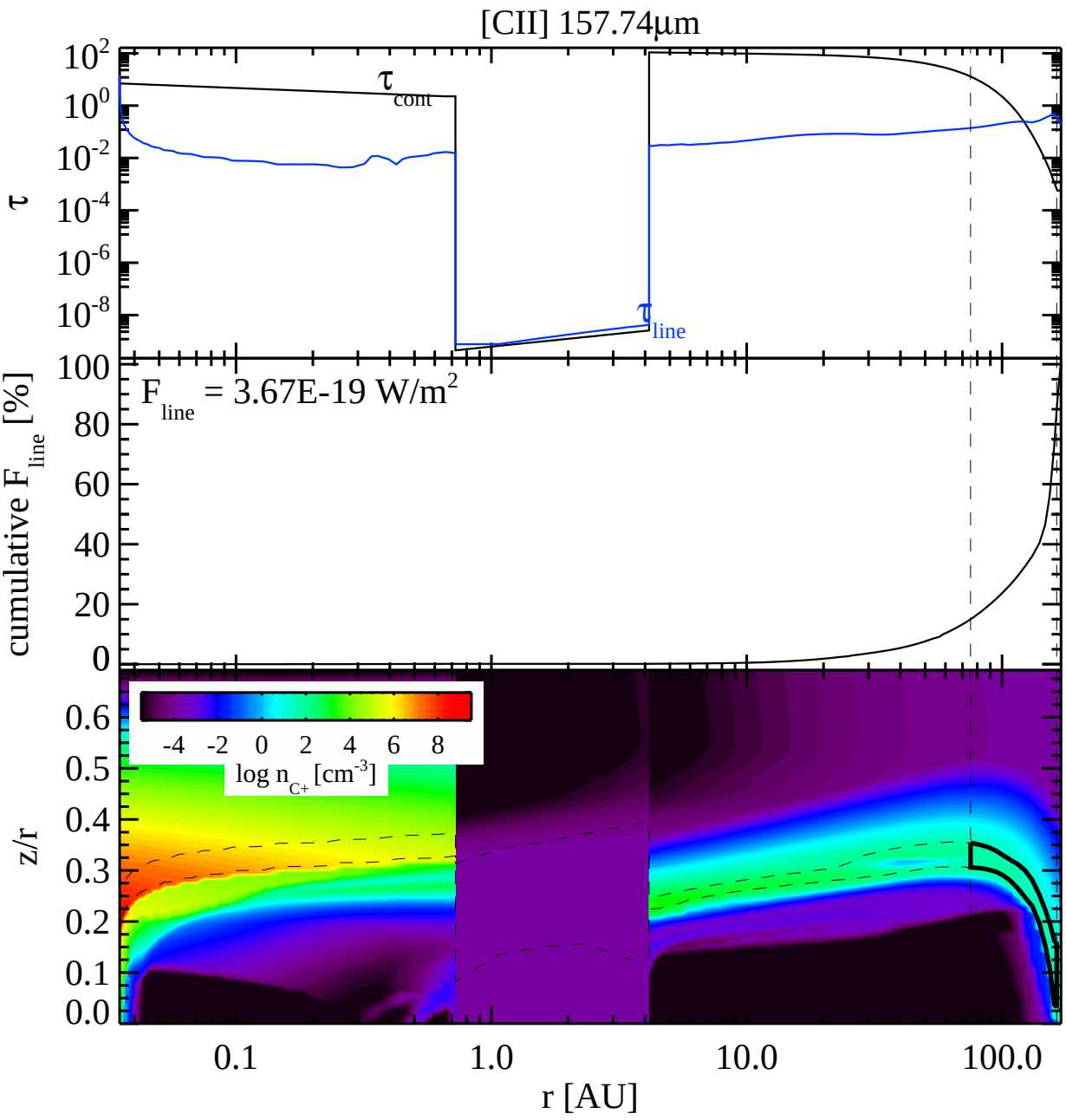

CO 2.361µm
τ
cumulative F line [%]
z/r
r [AU]
τ cont
τ line
F line = 1.02E-18 W/m2
log n CO [cm-3]
-4 -2 0 2 4 6 8
0.1
1.0
10.0
100.0

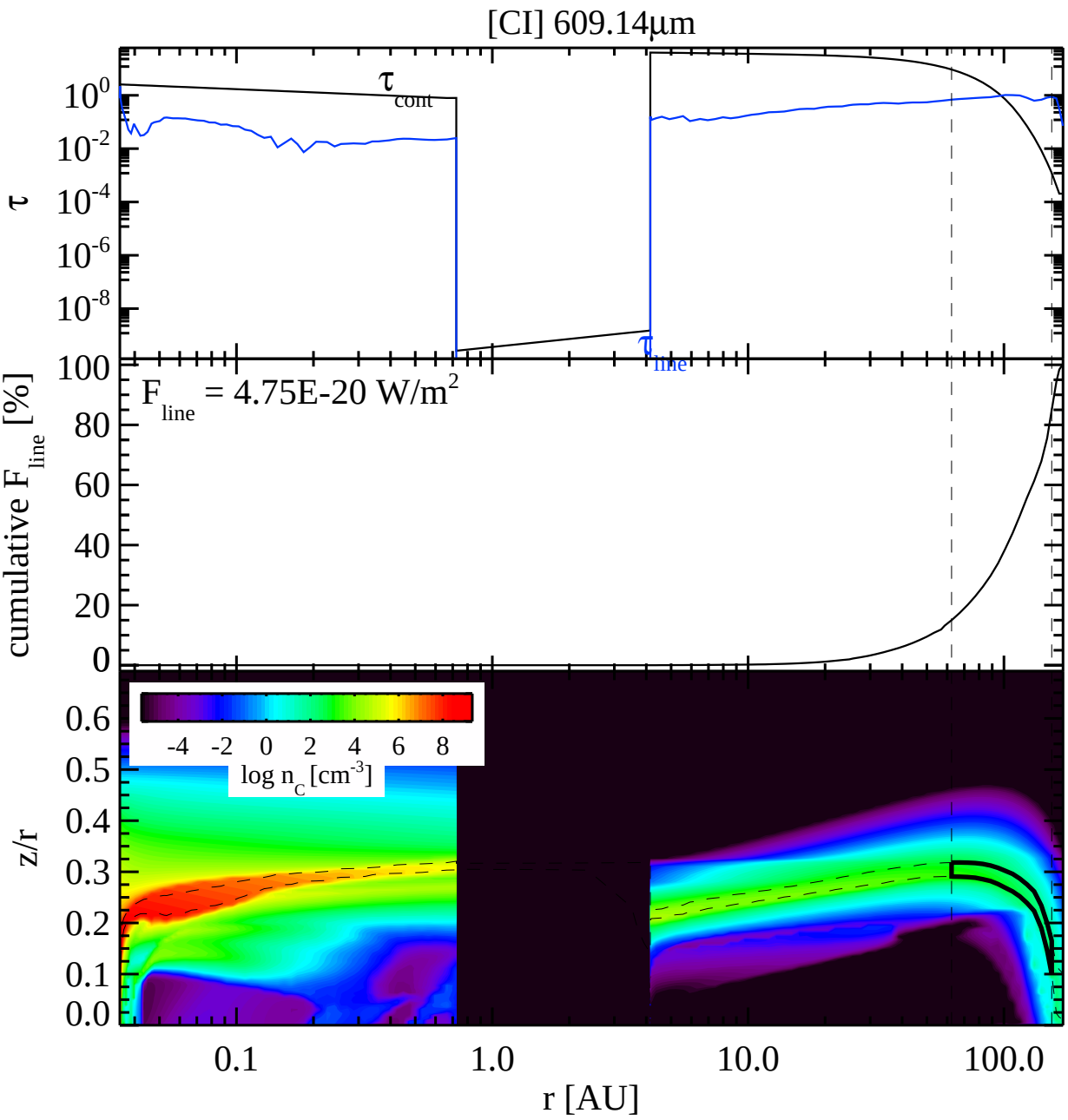

CO 2.376µm
τ
cont
τ
line
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
cumulative F_{line} [%]
F_{line} = 1.40E-18 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{CO} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

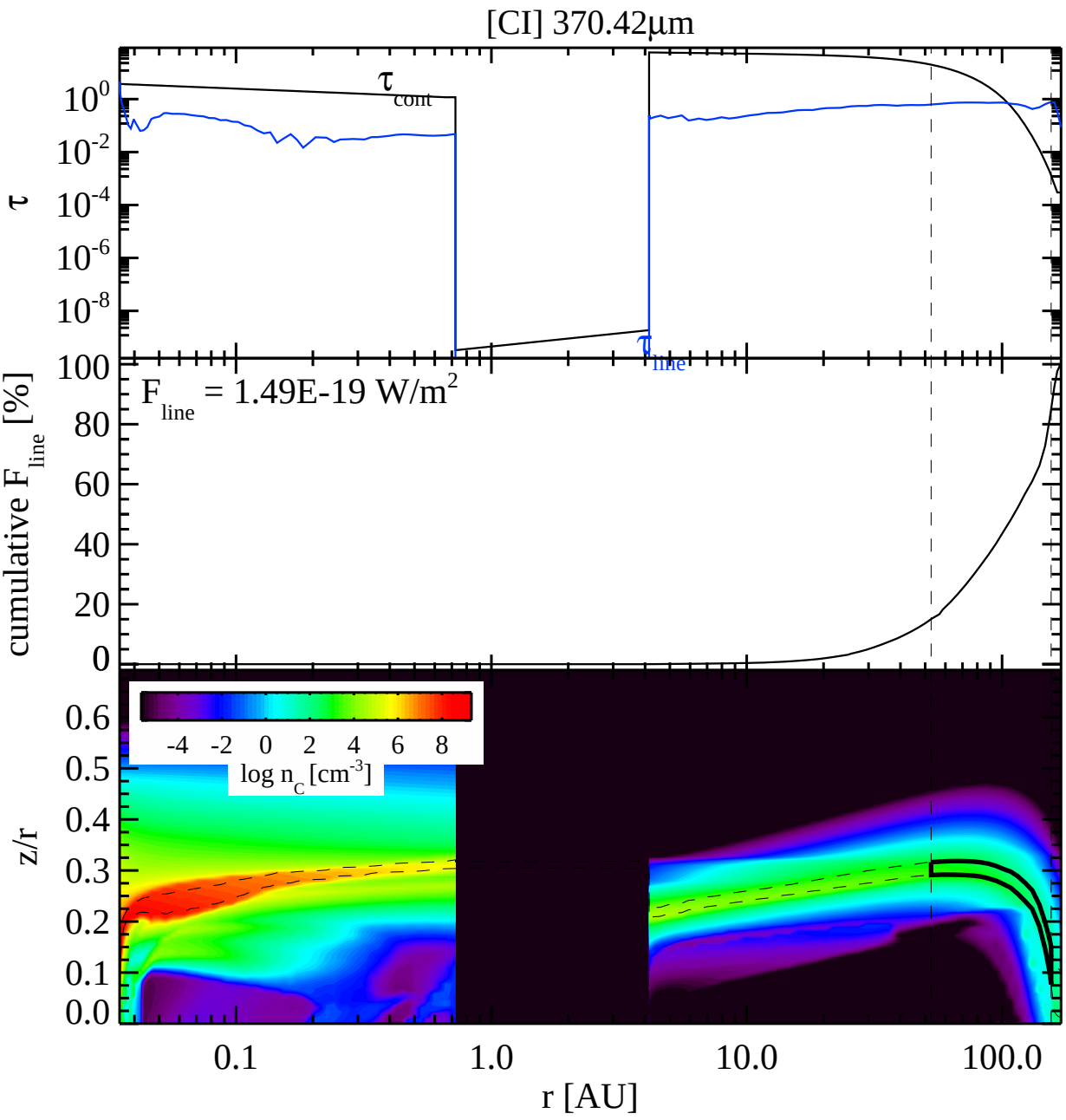

[OI] 63.18µm
τ
τ cont
τ line
cumulative F line [%]
F line = 6.40E-18 W/m2
log n O [cm-3]
-4 -2 0 2 4 6 8
z/r
r [AU]
0.1
1.0
10.0
100.0

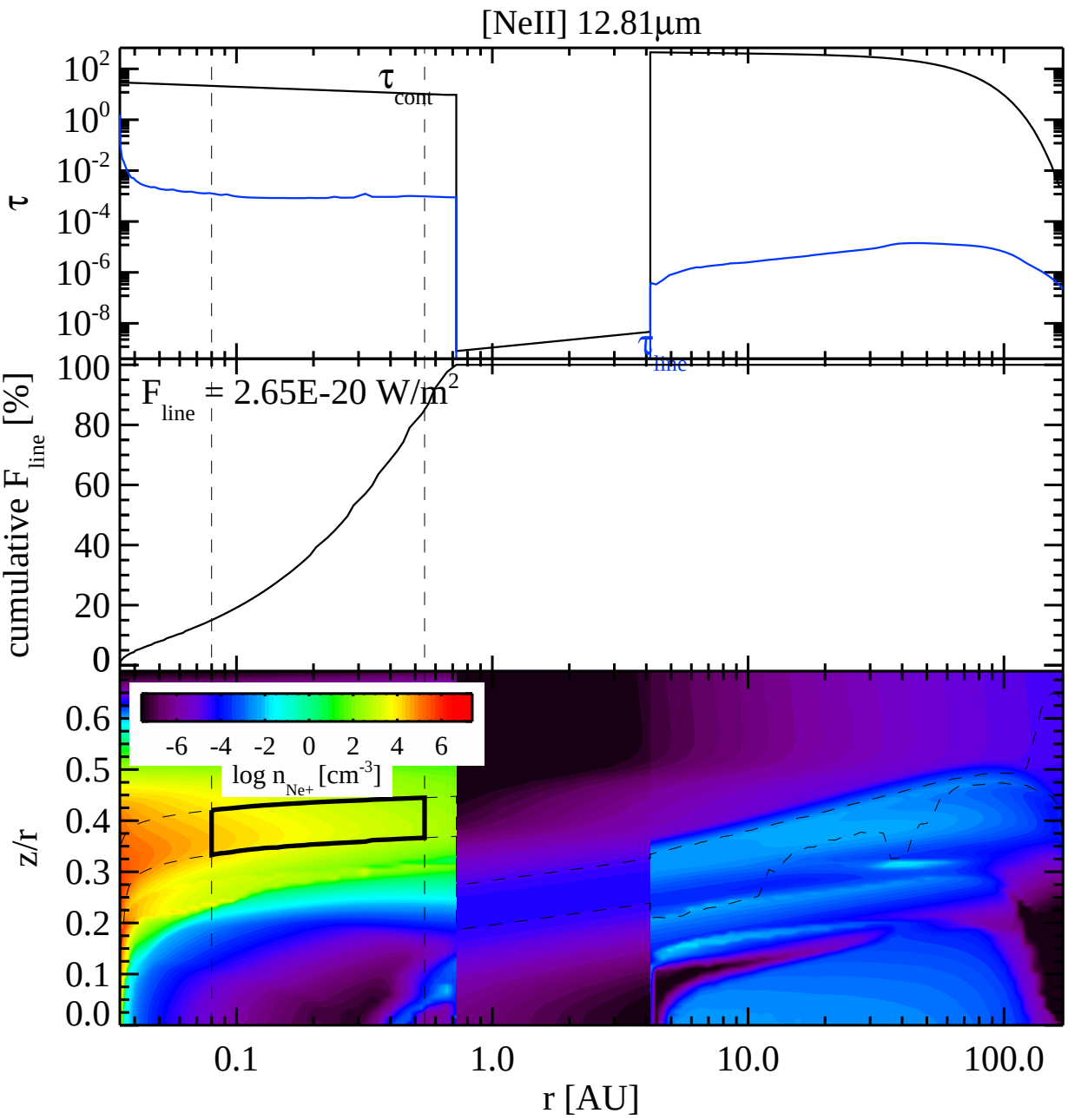

[OI] 145.53µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 1.45E-19 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_O [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

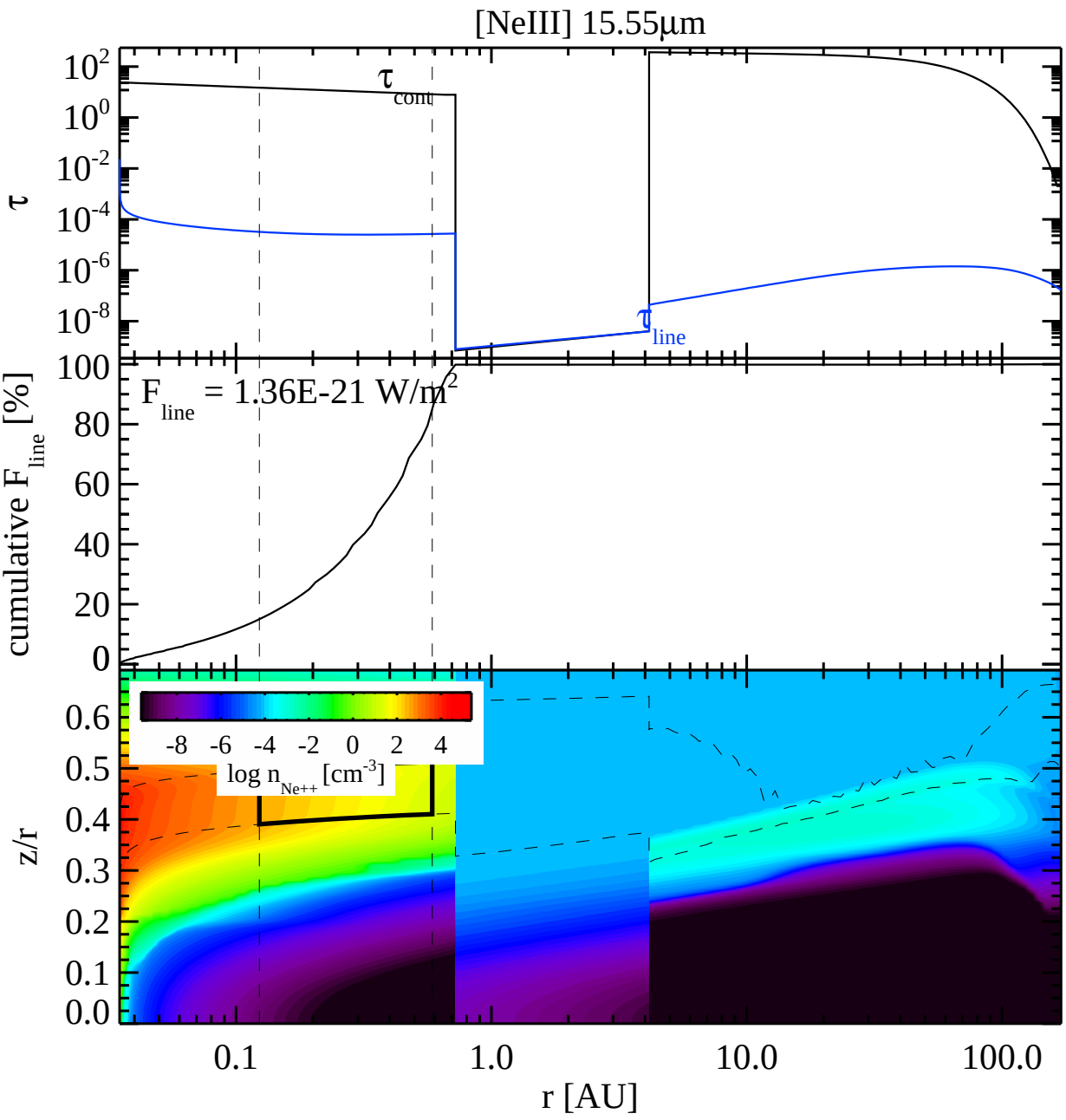

[OI] 0.6300µm
τ
τ cont
τ line
cumulative F line [%]
F line = 9.32E-18 W/m2
log n O [cm-3]
-4 -2 0 2 4 6 8
z/r
r [AU]
0.1
1.0
10.0
100.0

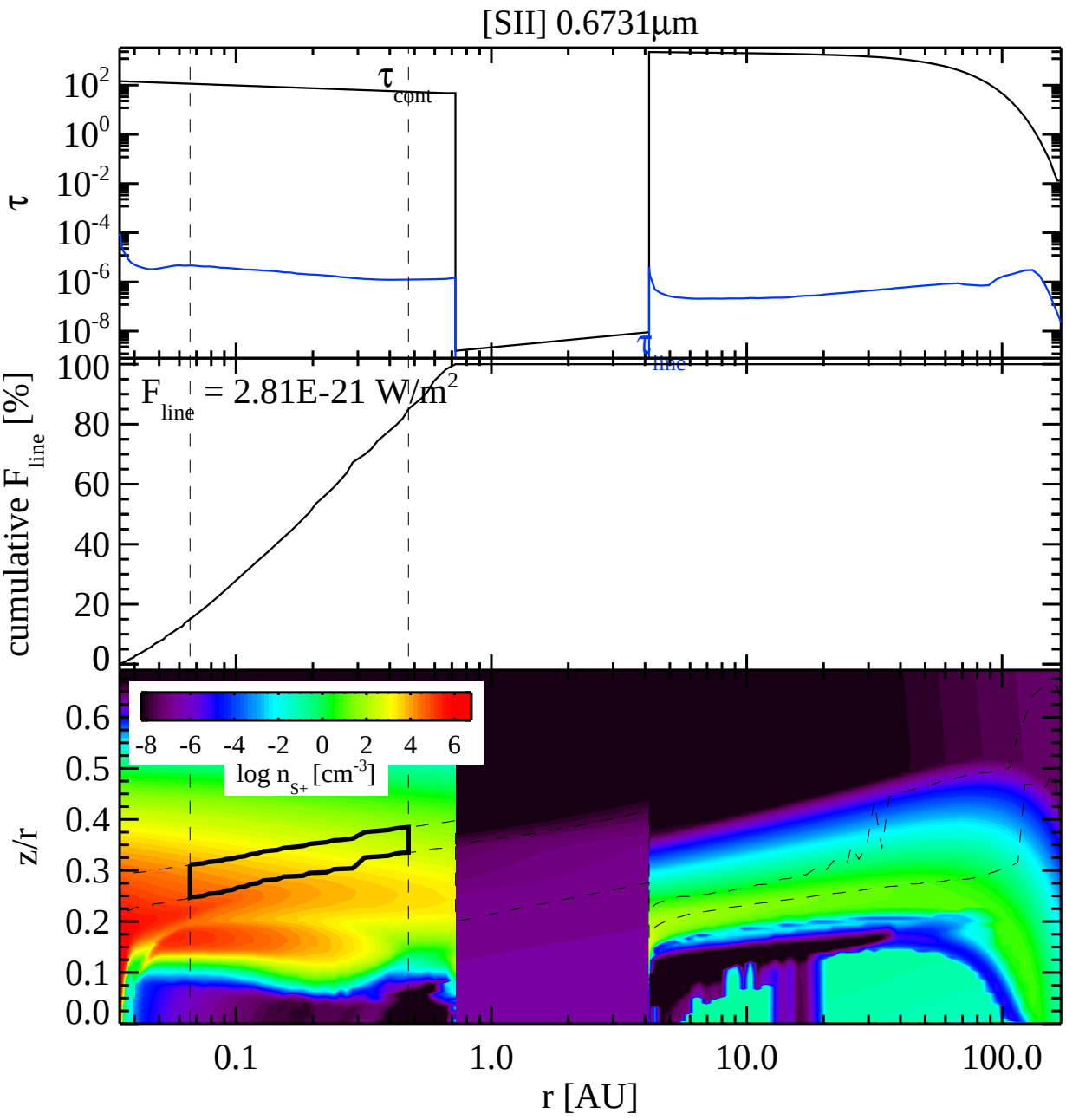

[CII] 157.74µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.67E-19 W/m2
z/r
log n C+ [cm-3]
r [AU]

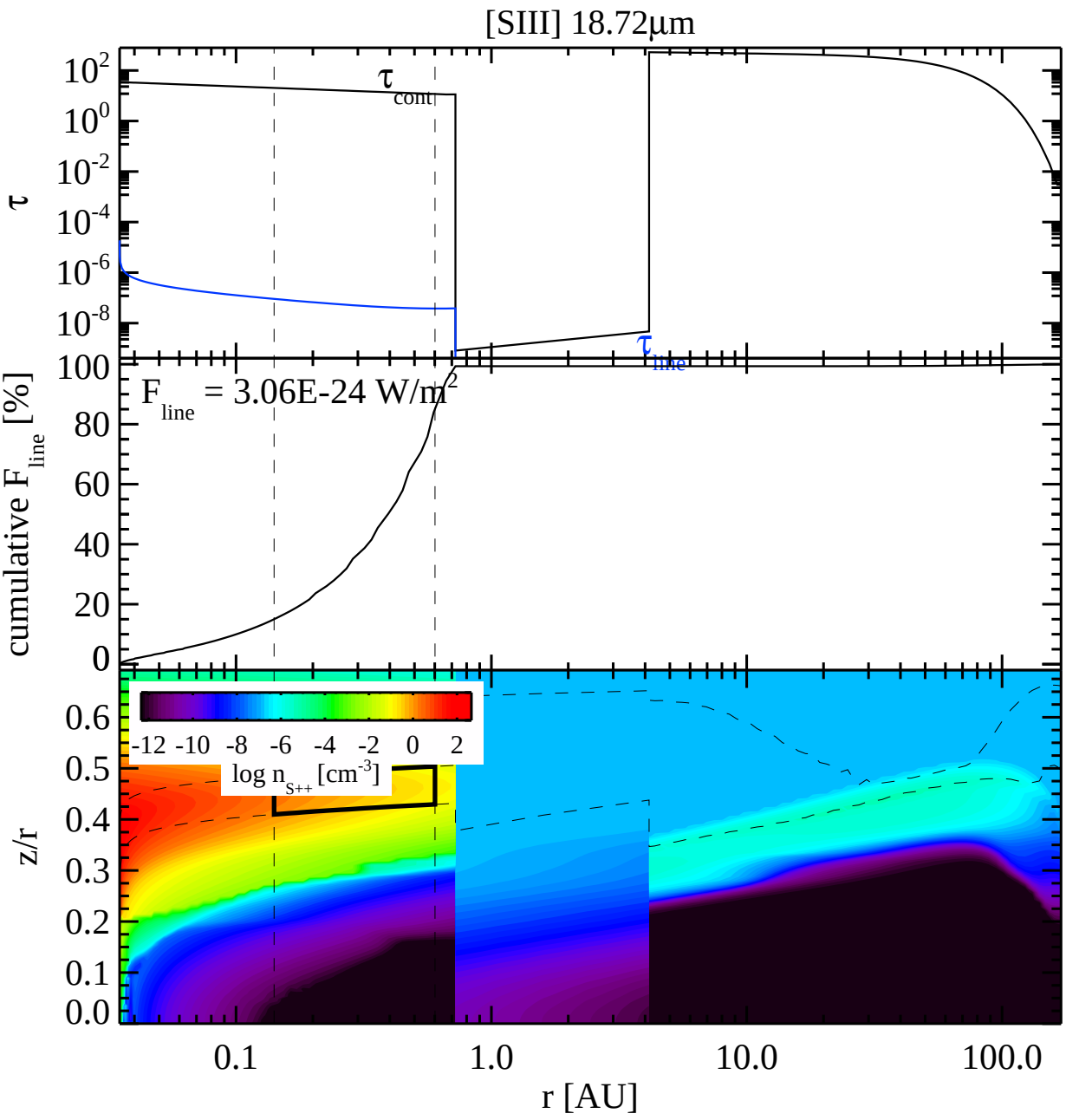

[CI] 609.14µm
τ
τ cont
τ line
cumulative F line [%]
F line = 4.75E-20 W/m2
log n C [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

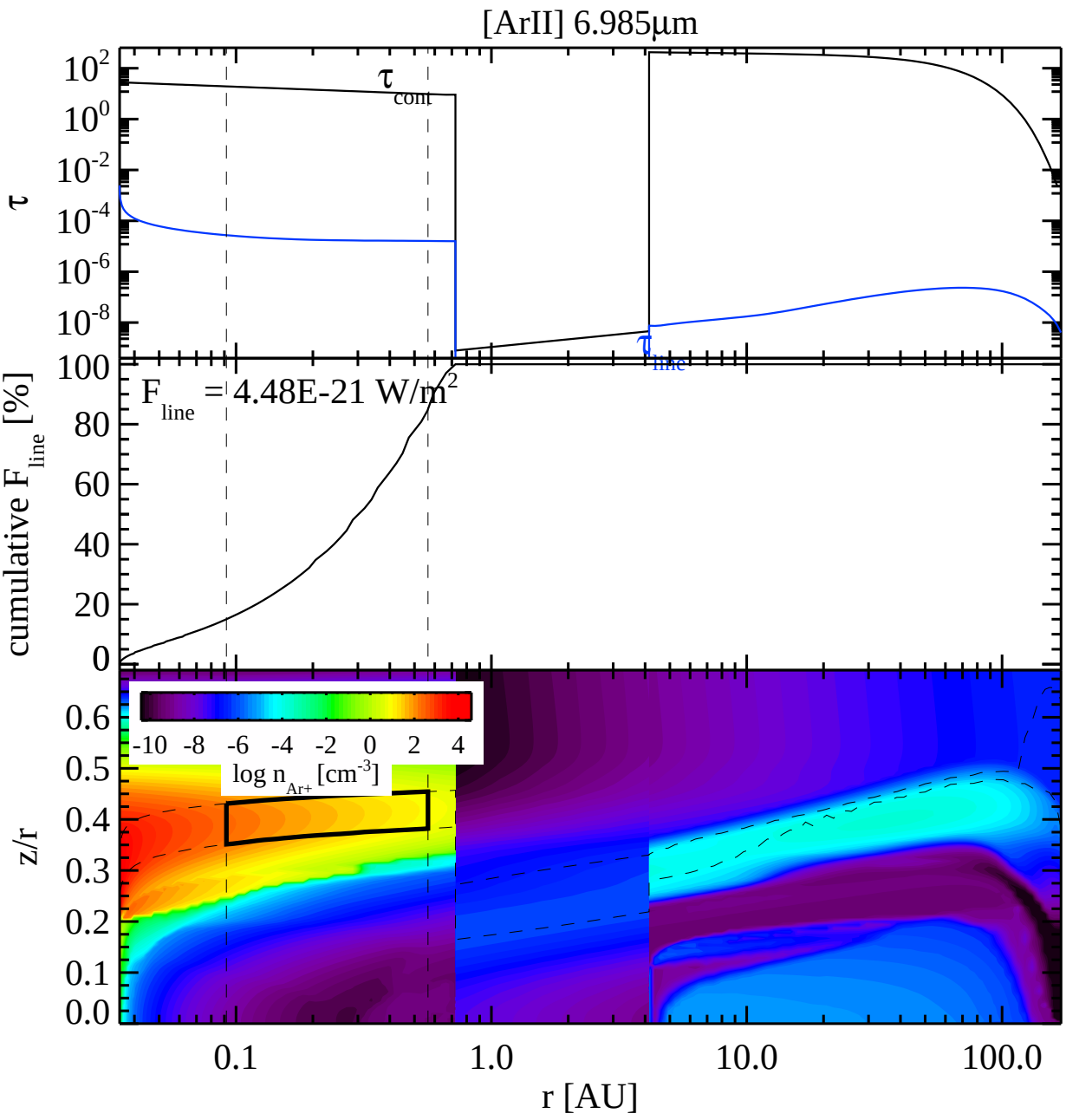

[CI] 370.42µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.49E-19 W/m2
log n C [cm-3]
z/r
r [AU]

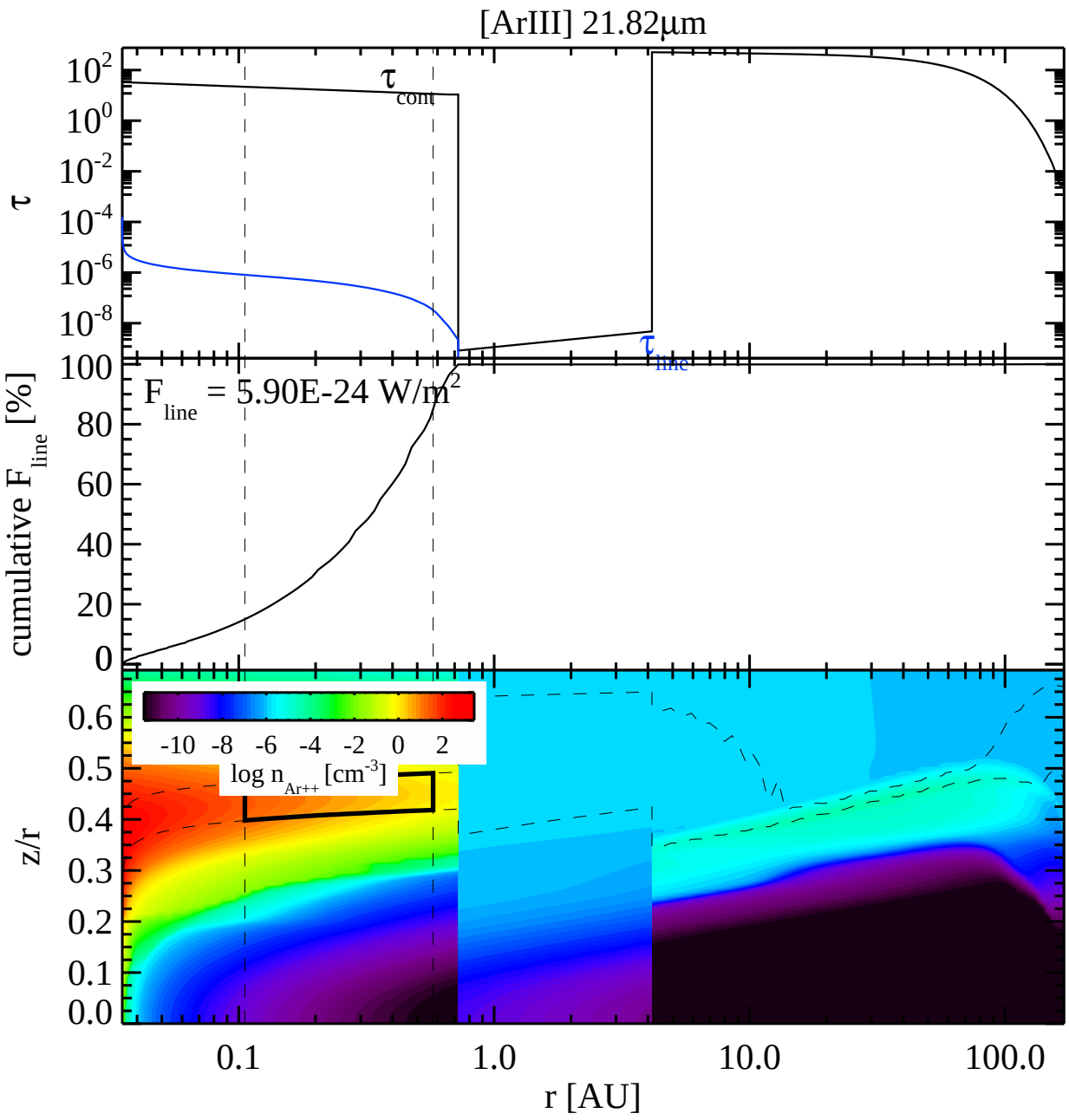

[NeII] 12.81µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.65E-20 W/m2
log n Ne+ [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

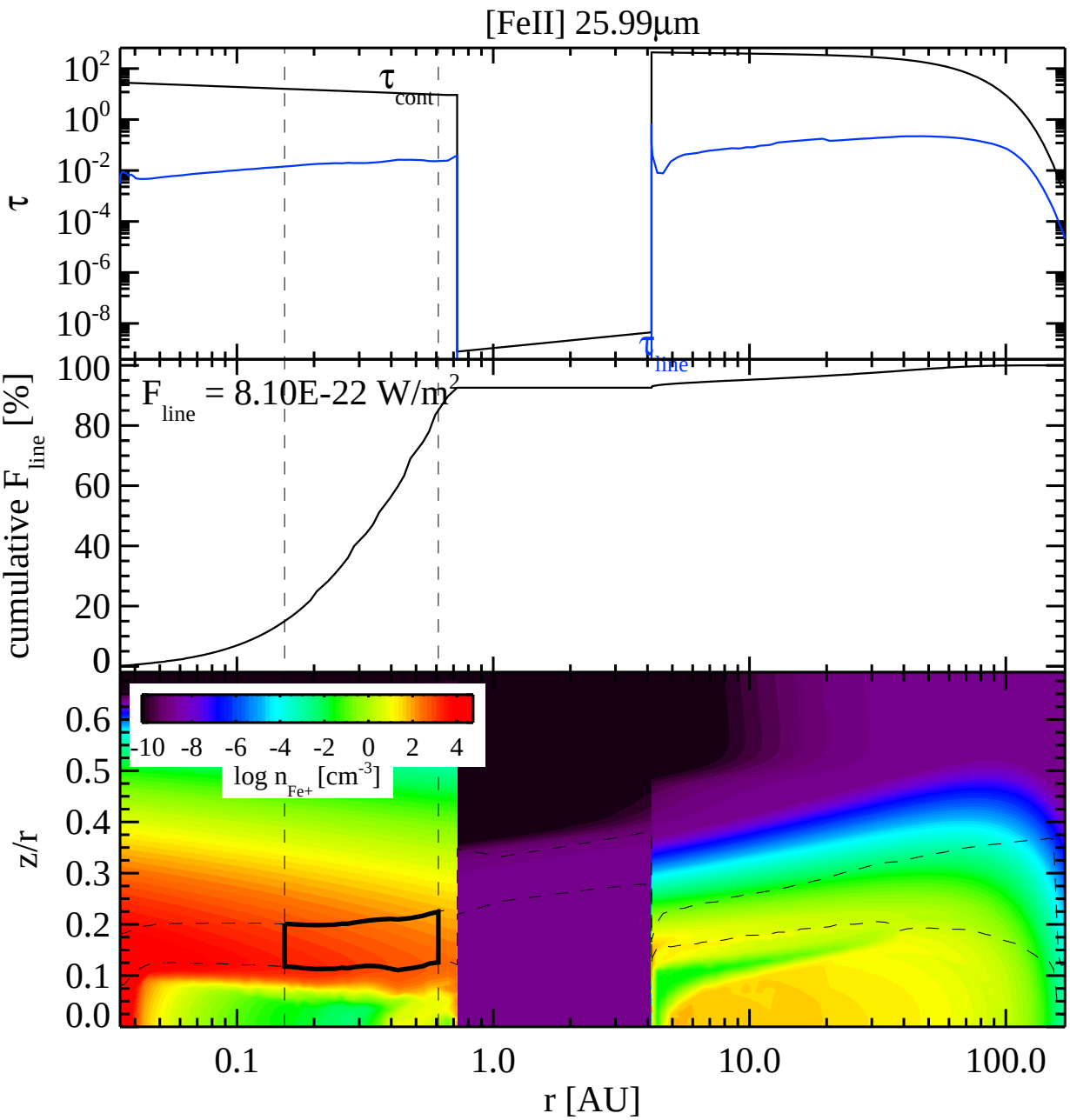

[NeIII] 15.55µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.36E-21 W/m2
log n Ne++ [cm-3]
z/r
r [AU]

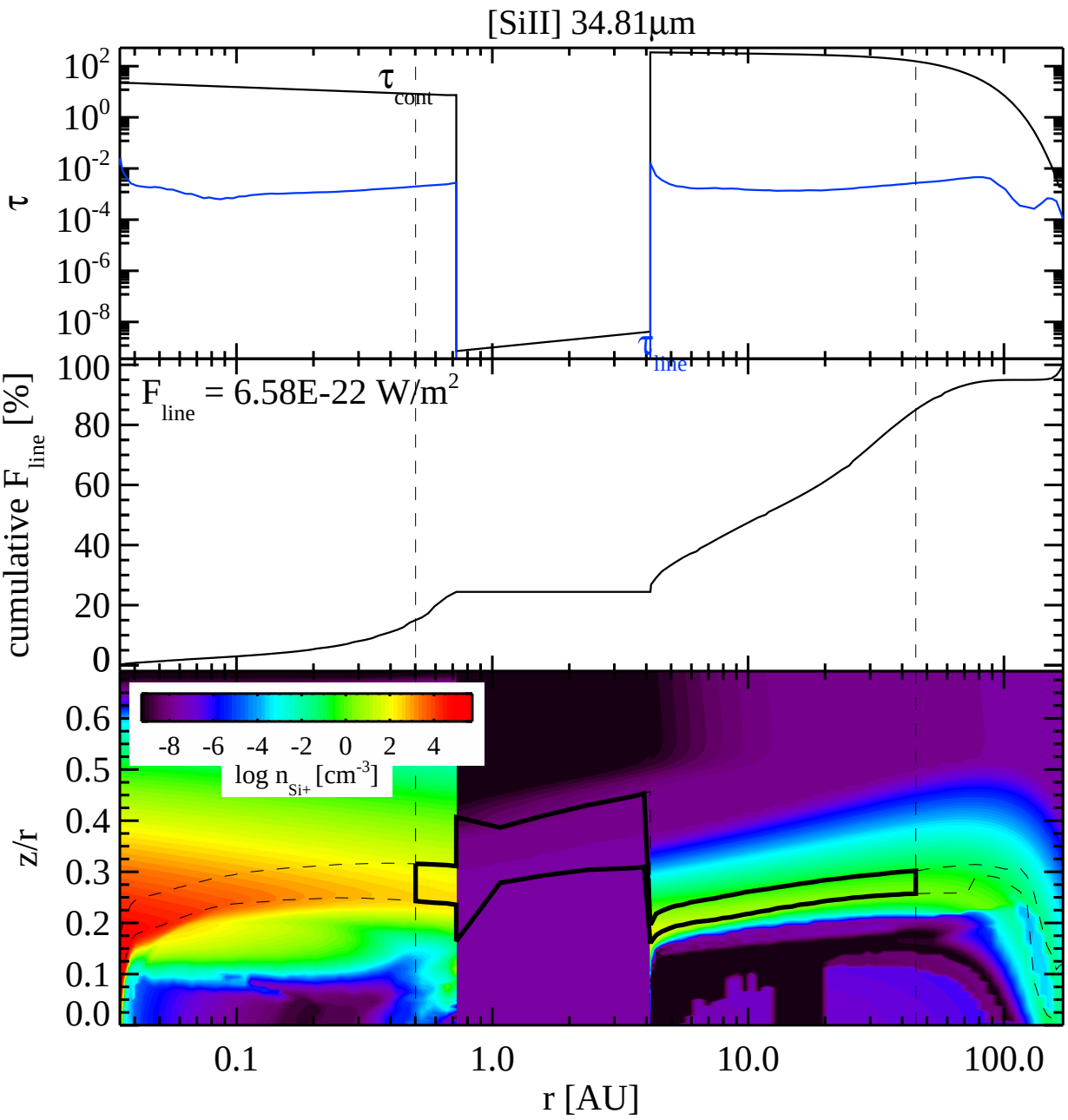

[SII] 0.6731µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.81E-21 W/m2
z/r
log n S+ [cm-3]
-8 -6 -4 -2 0 2 4 6
r [AU]
0.1
1.0
10.0
100.0

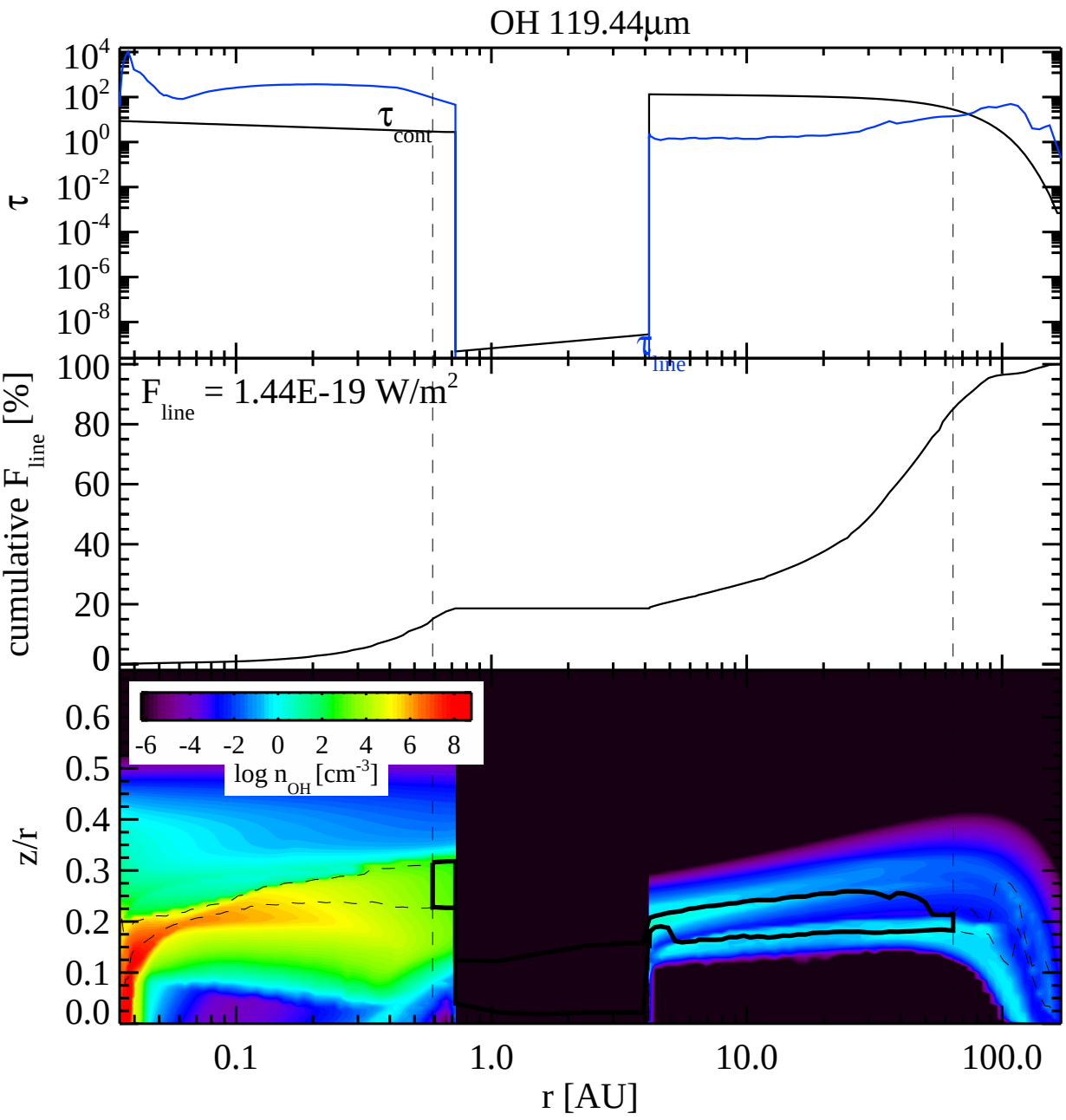

[SIII] 18.72µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.06E-24 W/m2
log n S++ [cm-3]
-12 -10 -8 -6 -4 -2 0 2
z/r
r [AU]
0.1
1.0
10.0
100.0

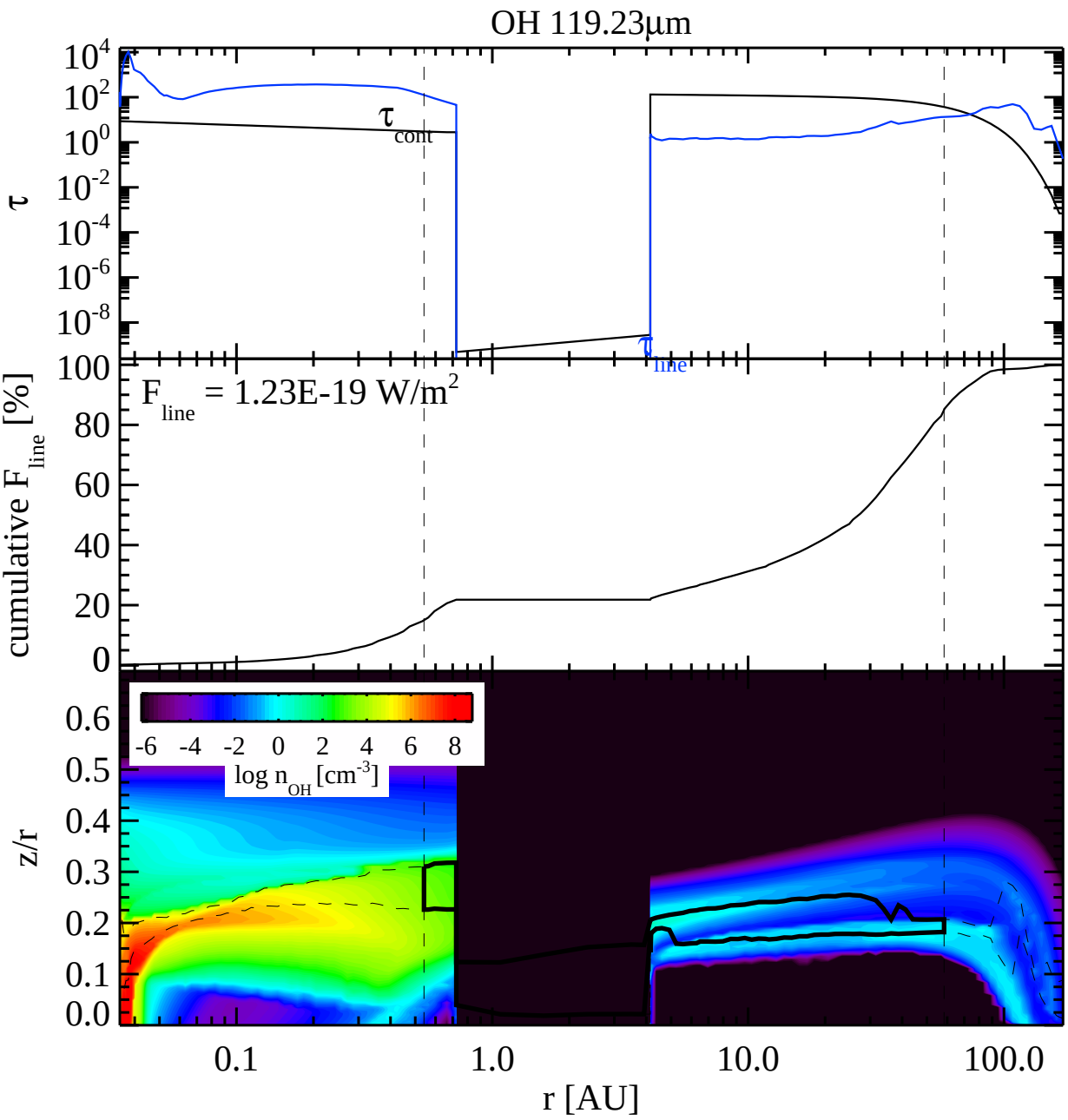

[ArII] 6.985µm
τ
τ cont
τ line
cumulative F line [%]
F line = 4.48E-21 W/m2
log n Ar+ [cm-3]
-10 -8 -6 -4 -2 0 2 4
z/r
r [AU]
0.1
1.0
10.0
100.0

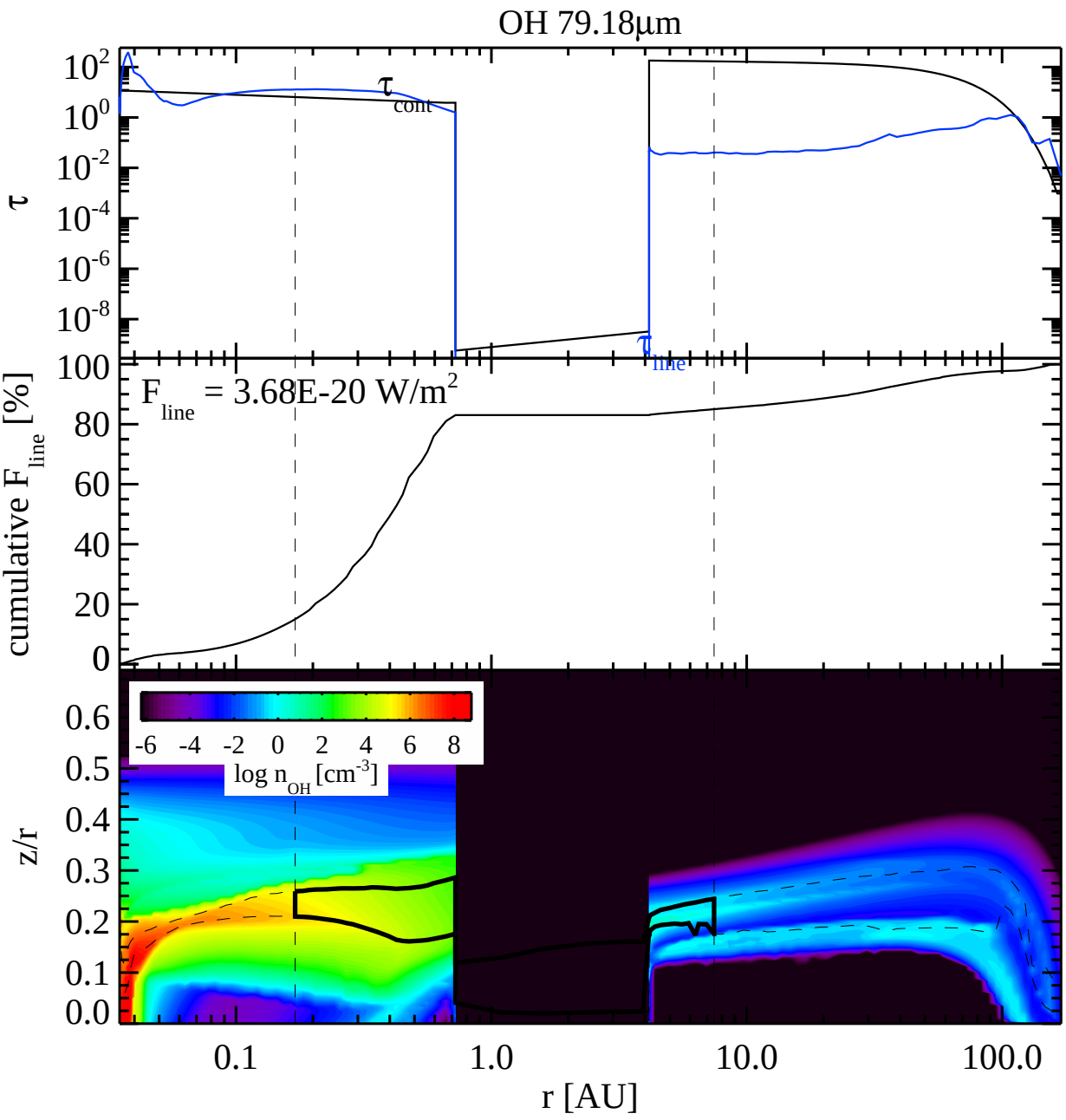

[ArIII] 21.82μm
τ
τ cont
τ line
cumulative F line [%]
F line = 5.90E-24 W/m2
z/r
log n Ar++ [cm-3]
-10 -8 -6 -4 -2 0 2
r [AU]
0.1
1.0
10.0
100.0

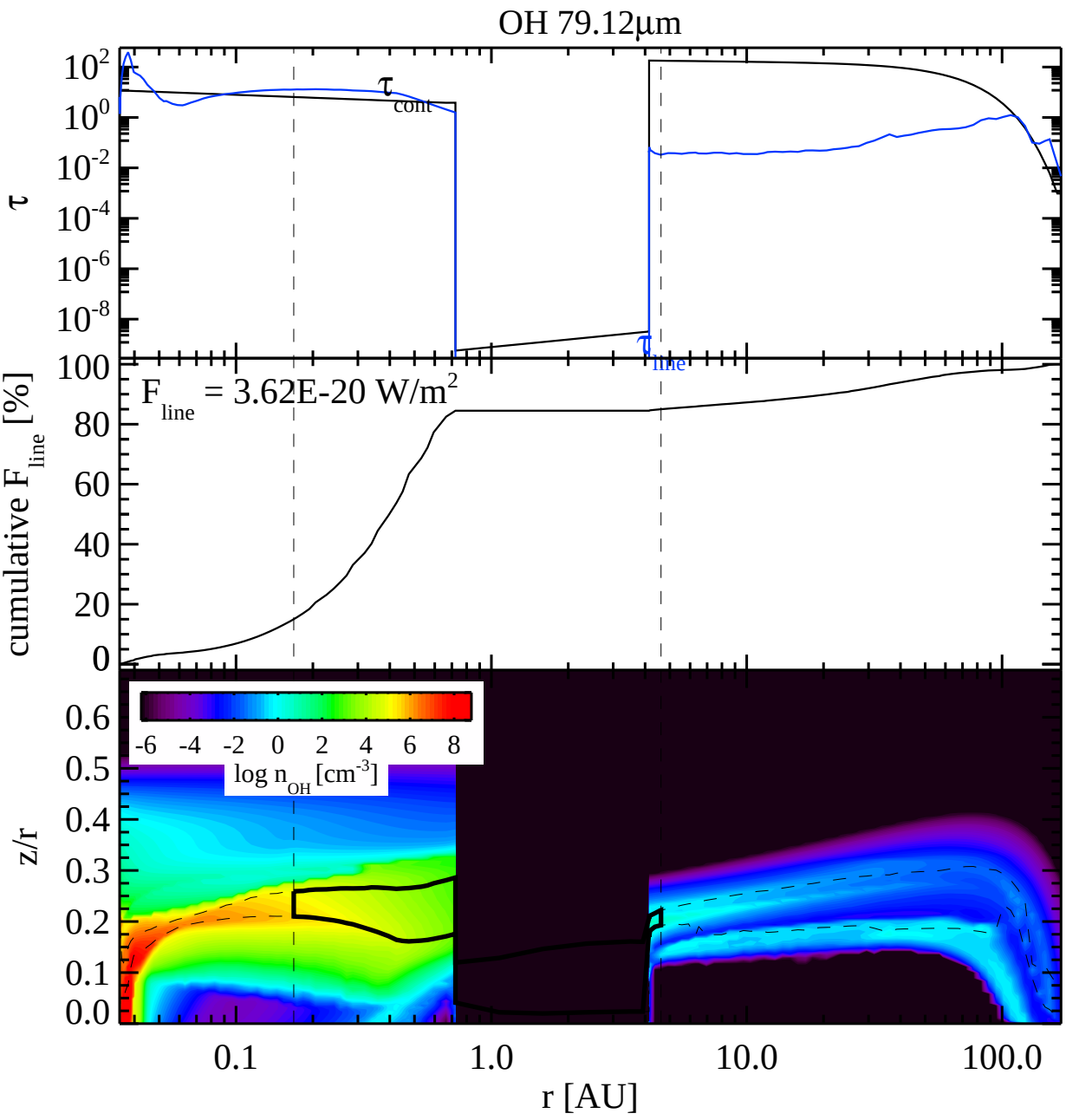

[FeII] 25.99μm
τ
τ cont
τ line
cumulative F line [%]
F line = 8.10E-22 W/m2
z/r
log n Fe+ [cm-3]
-10 -8 -6 -4 -2 0 2 4
r [AU]
0.1
1.0
10.0
100.0

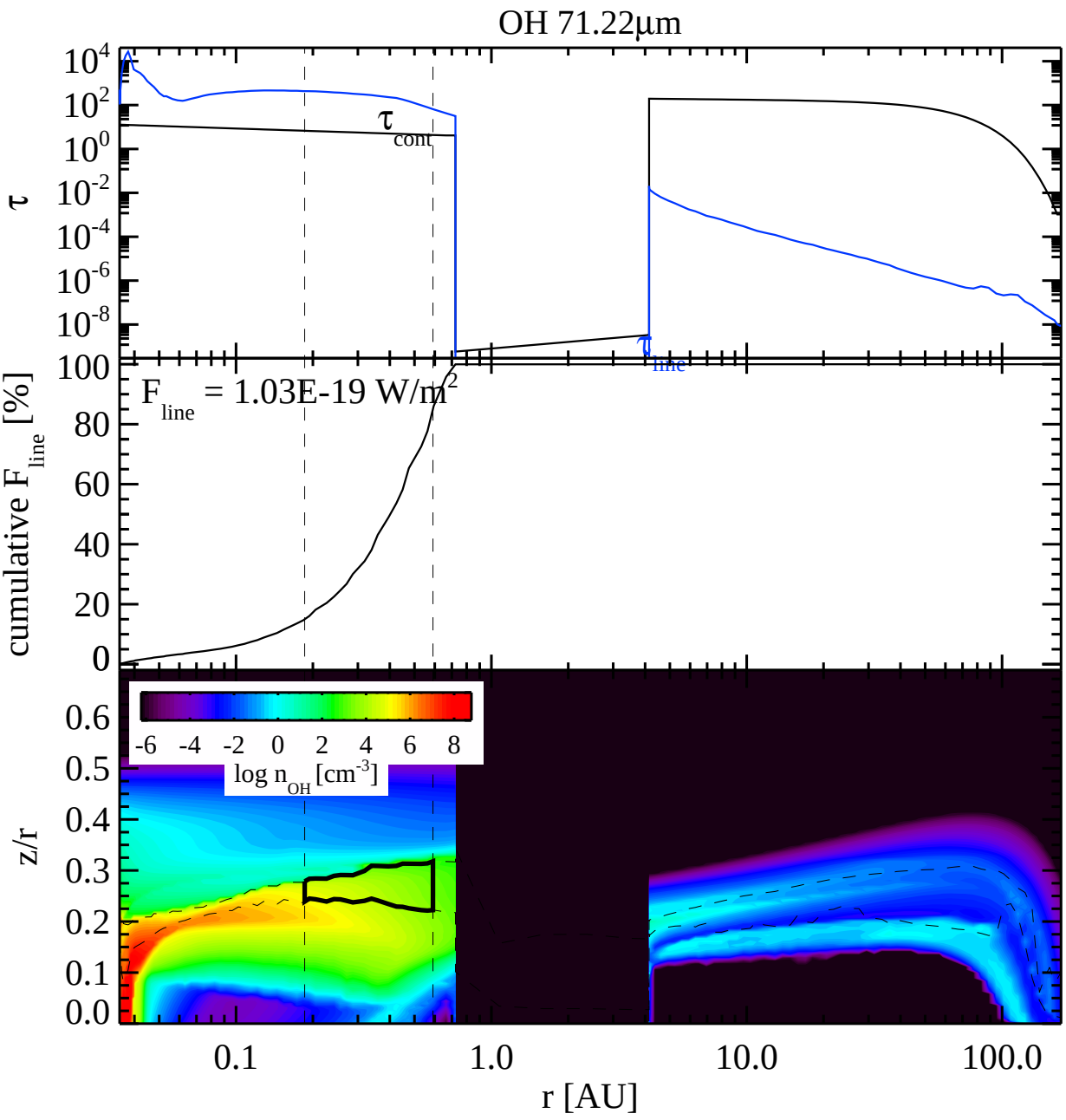

[SiII] 34.81µm
τ
τ cont
τ line
cumulative F line [%]
F line = 6.58E-22 W/m2
log n Si+ [cm-3]
z/r
r [AU]

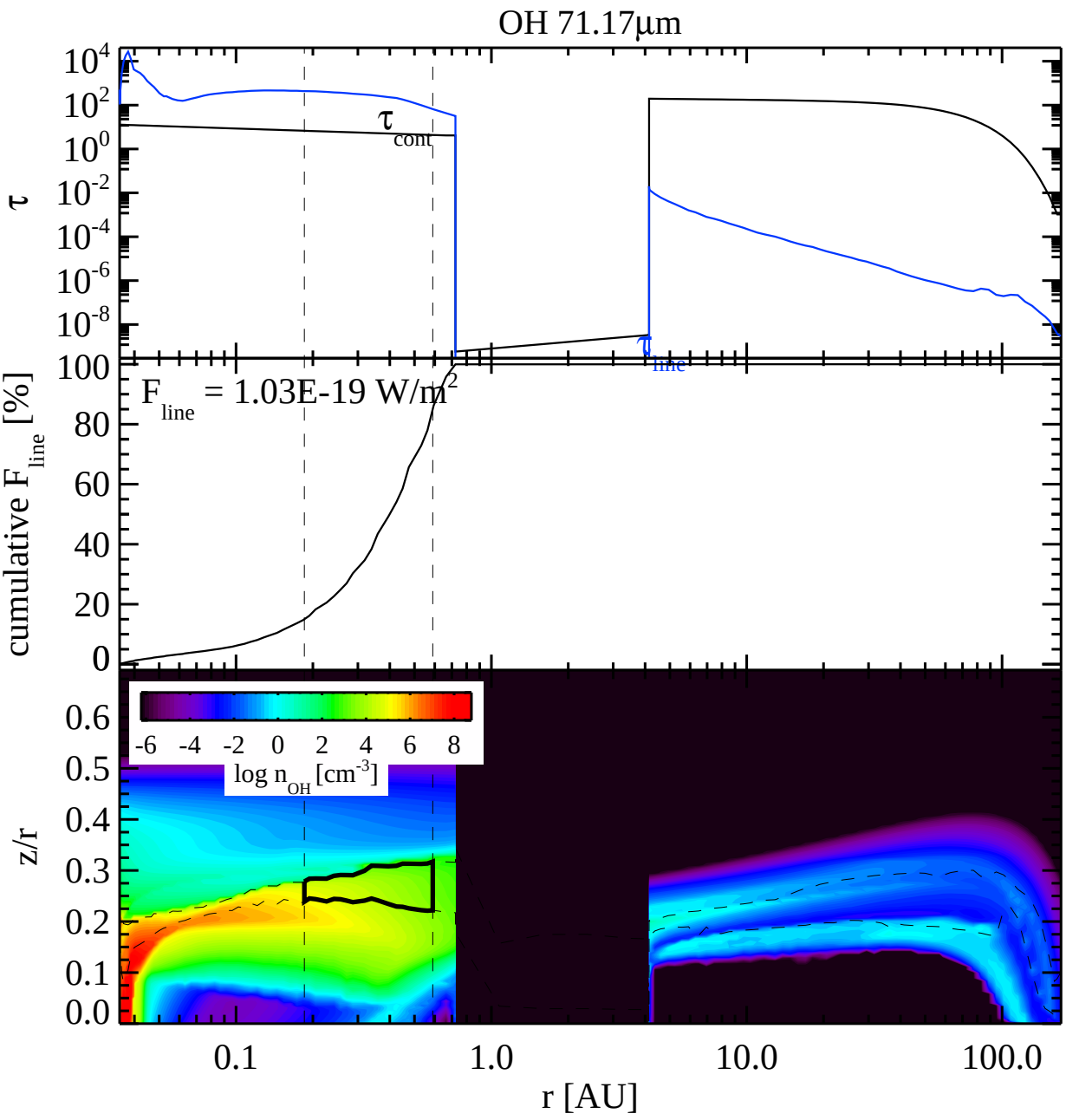

OH 119.44μm
τ
10^4
10^2
10^0
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.44E-19 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6 8
log n_{OH} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

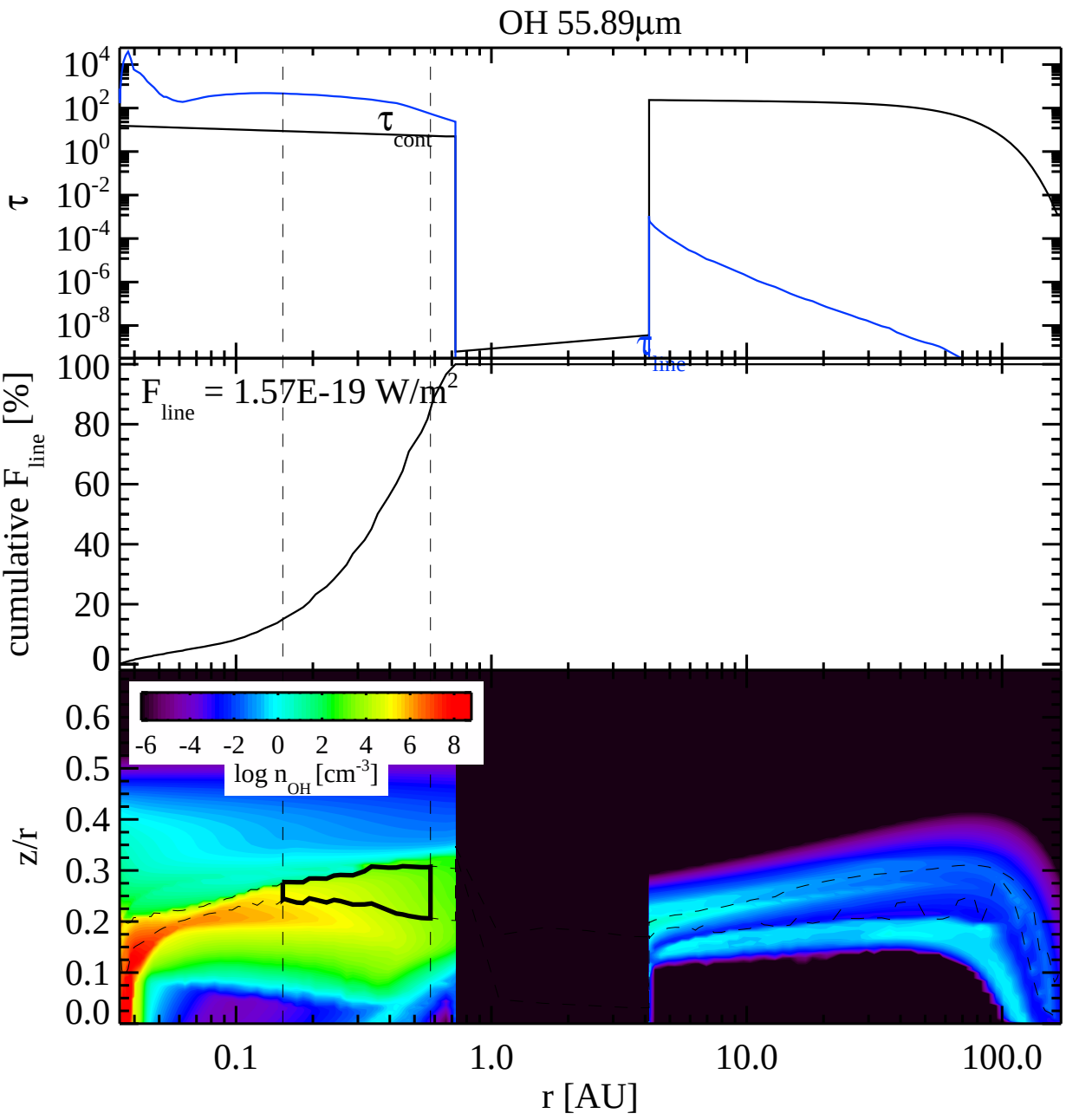

OH 119.23µm
τ
10^4
10^2
10^0
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.23E-19 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6 8
log n_{OH} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

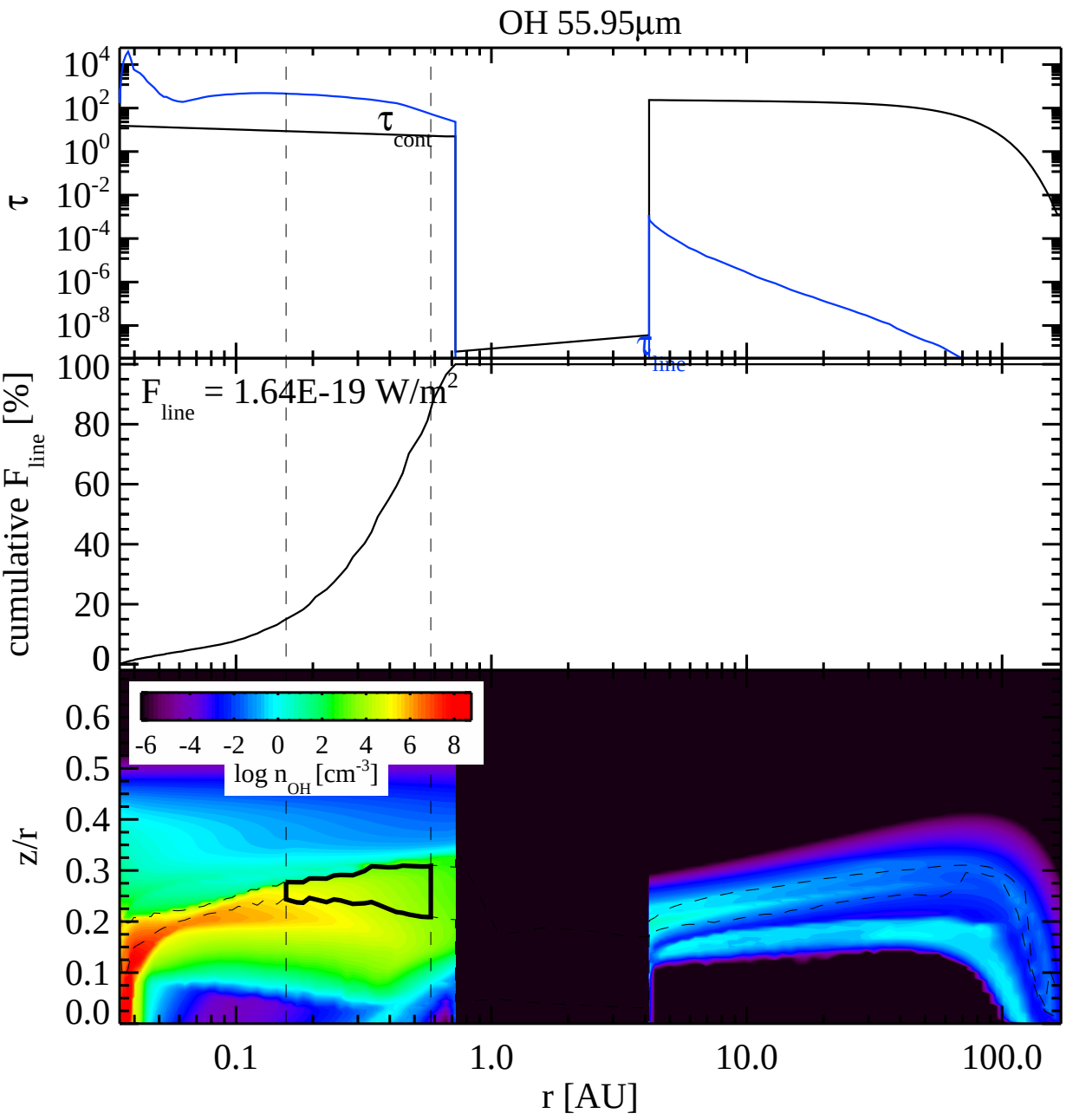

OH 79.18µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.68E-20 W/m2
log n OH [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

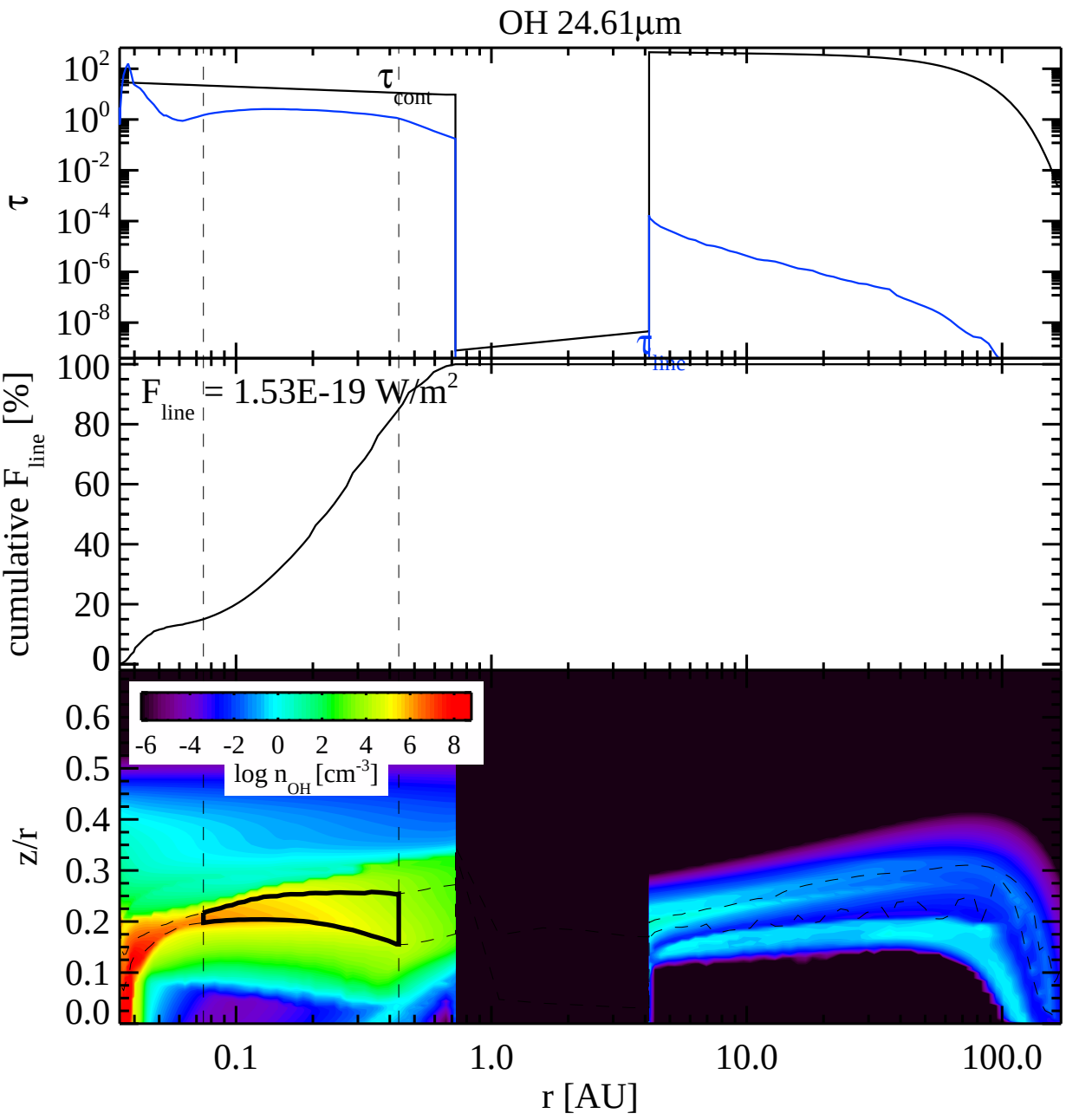

OH 79.12µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.62E-20 W/m2
log n OH [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

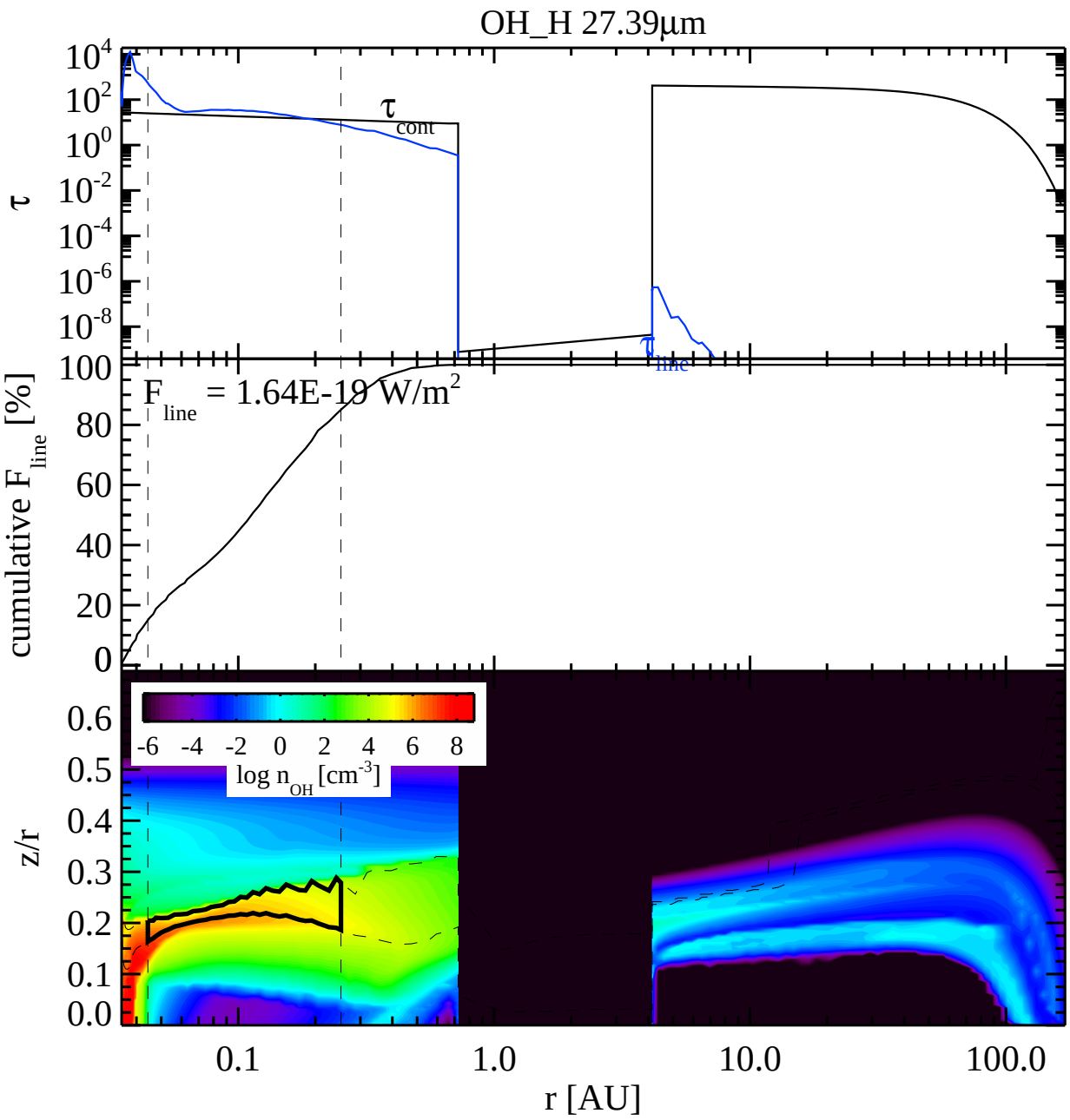

OH 71.22µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.03E-19 W/m2
log n OH [cm-3]
z/r
r [AU]

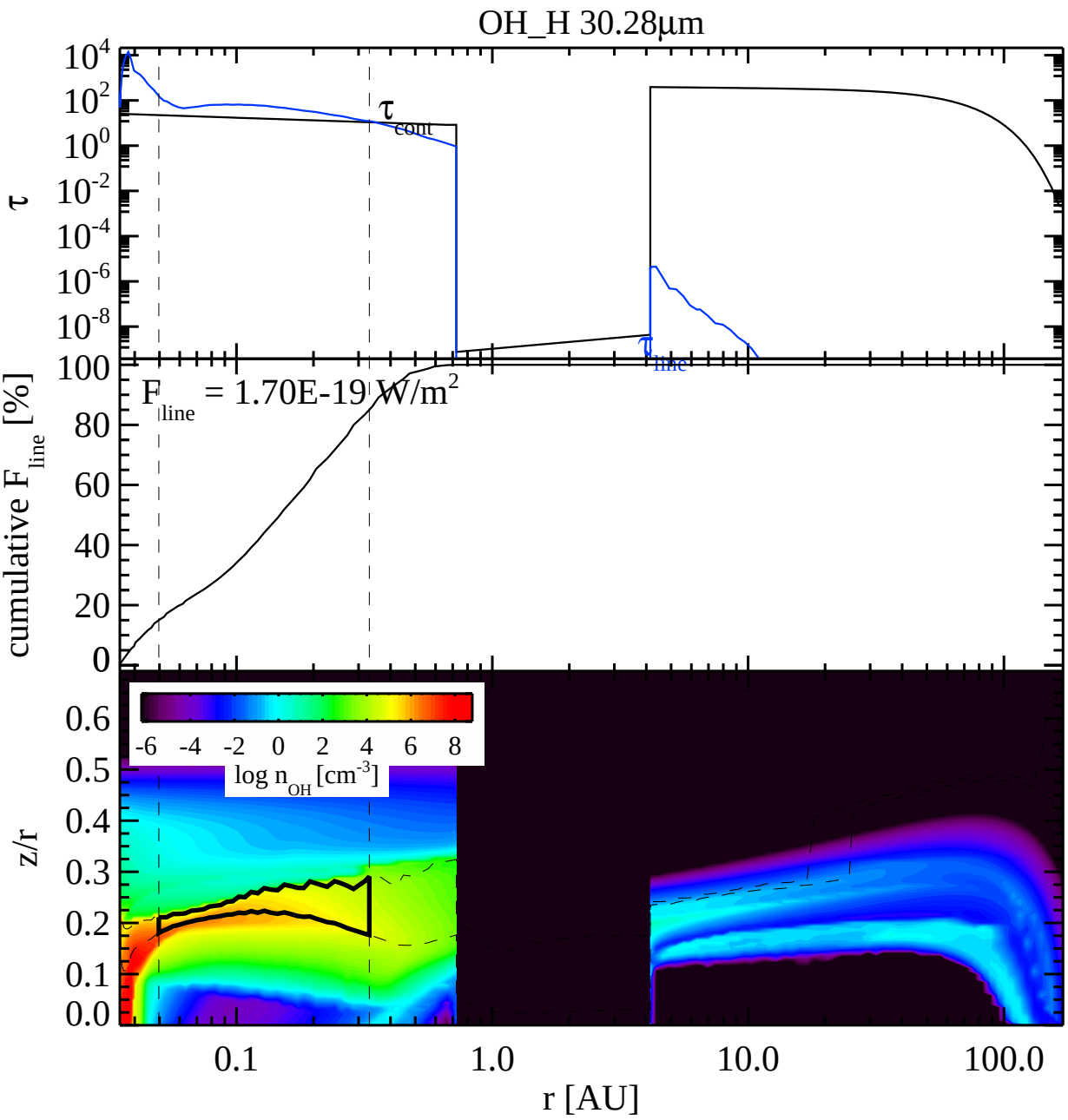

OH 71.17µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.03E-19 W/m2
log n OH [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

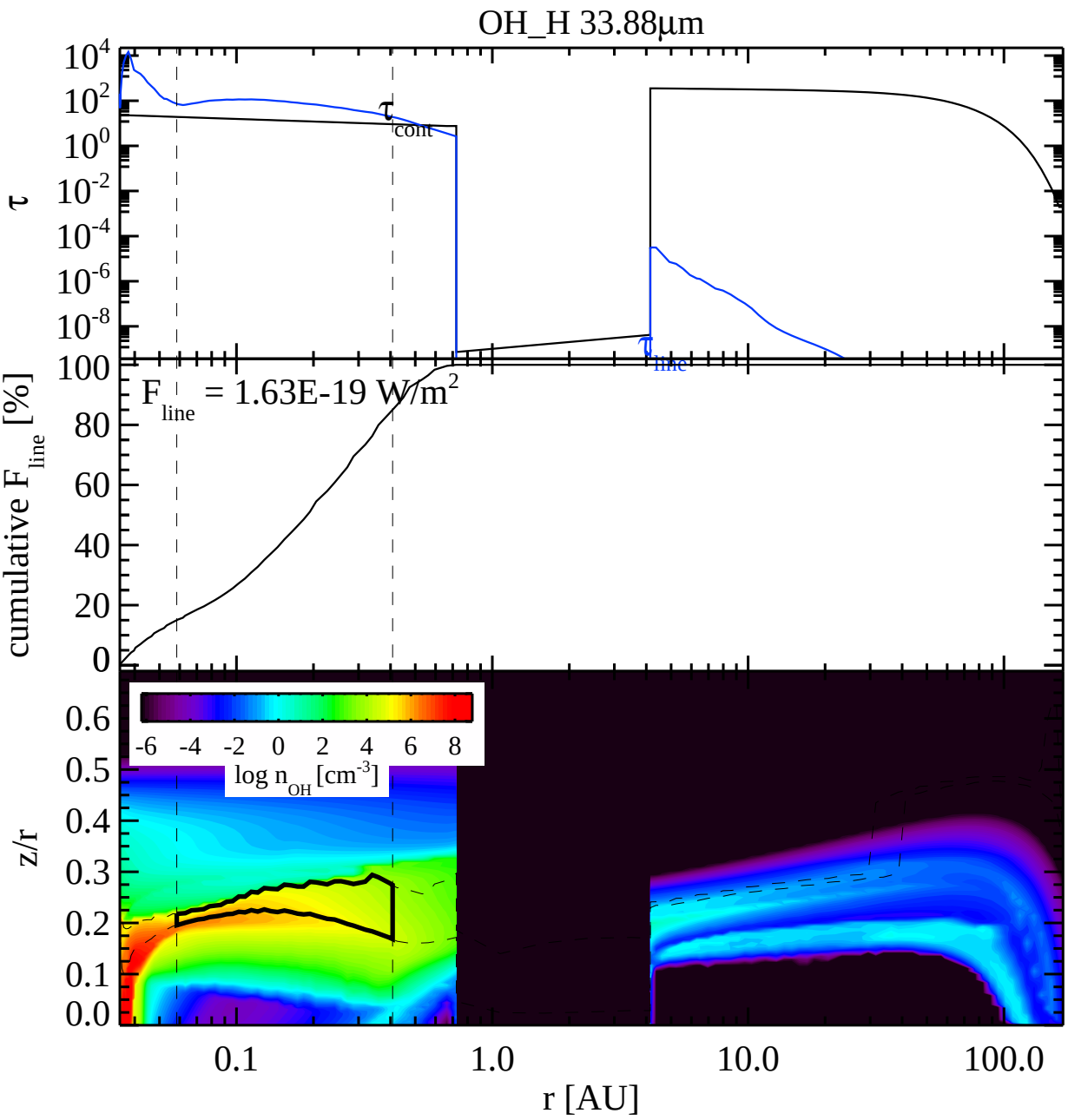

OH 55.89µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.57E-19 W/m2
log n OH [cm-3]
z/r
r [AU]

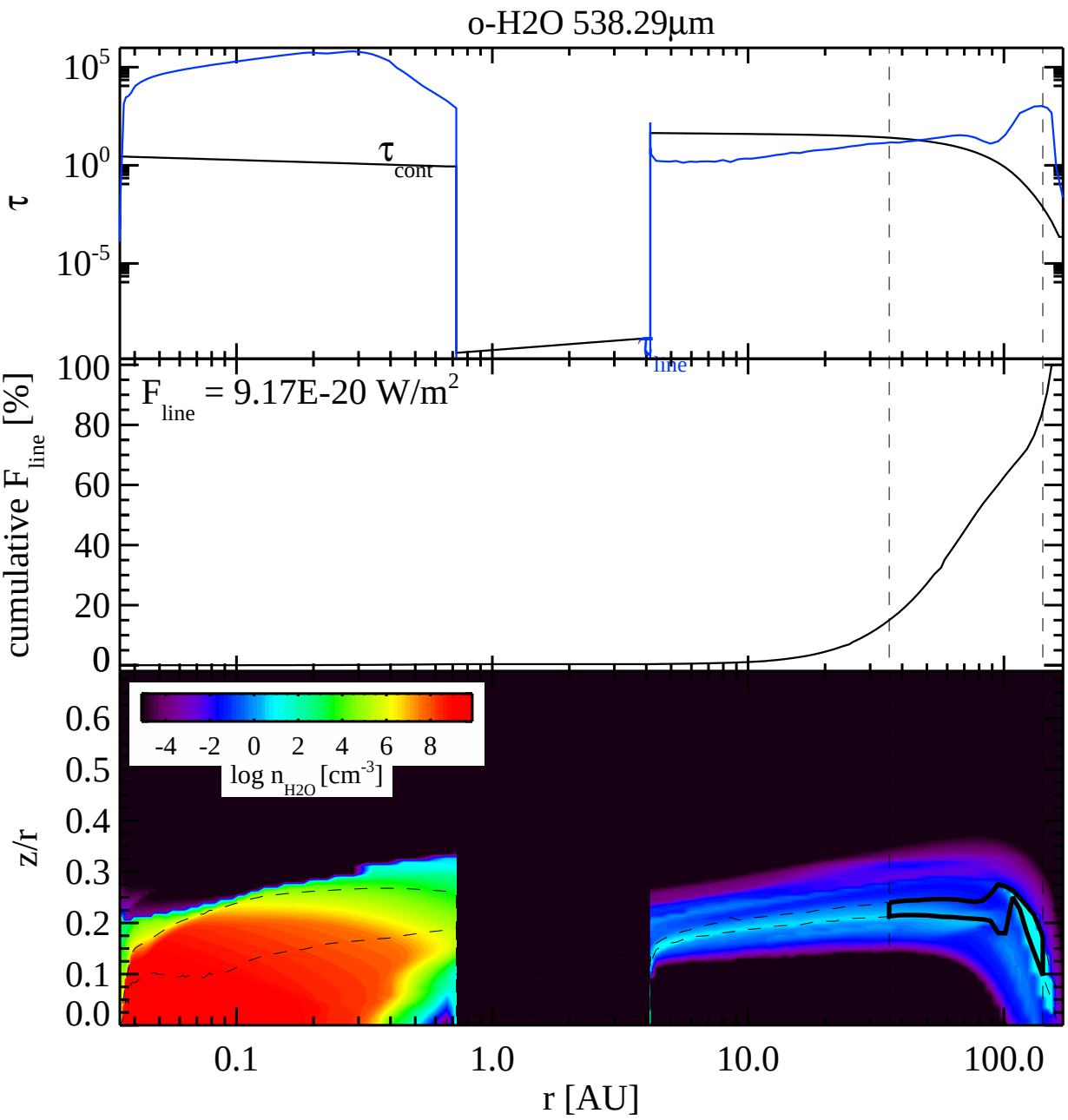

OH 55.95µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.64E-19 W/m2
log n OH [cm-3]
z/r
r [AU]

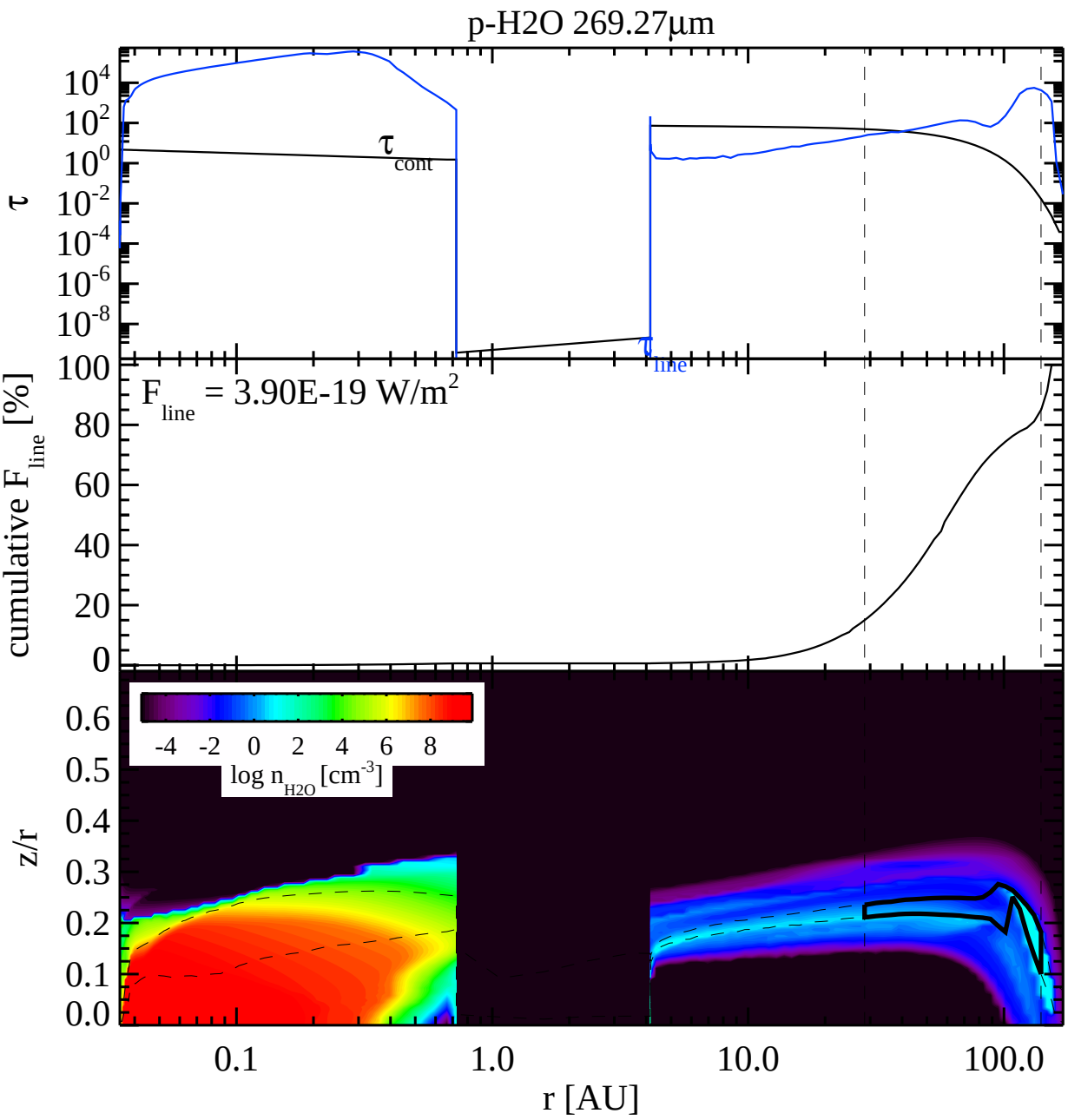

OH 24.61µm
τ
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.53E-19 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6 8
log n_{OH} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

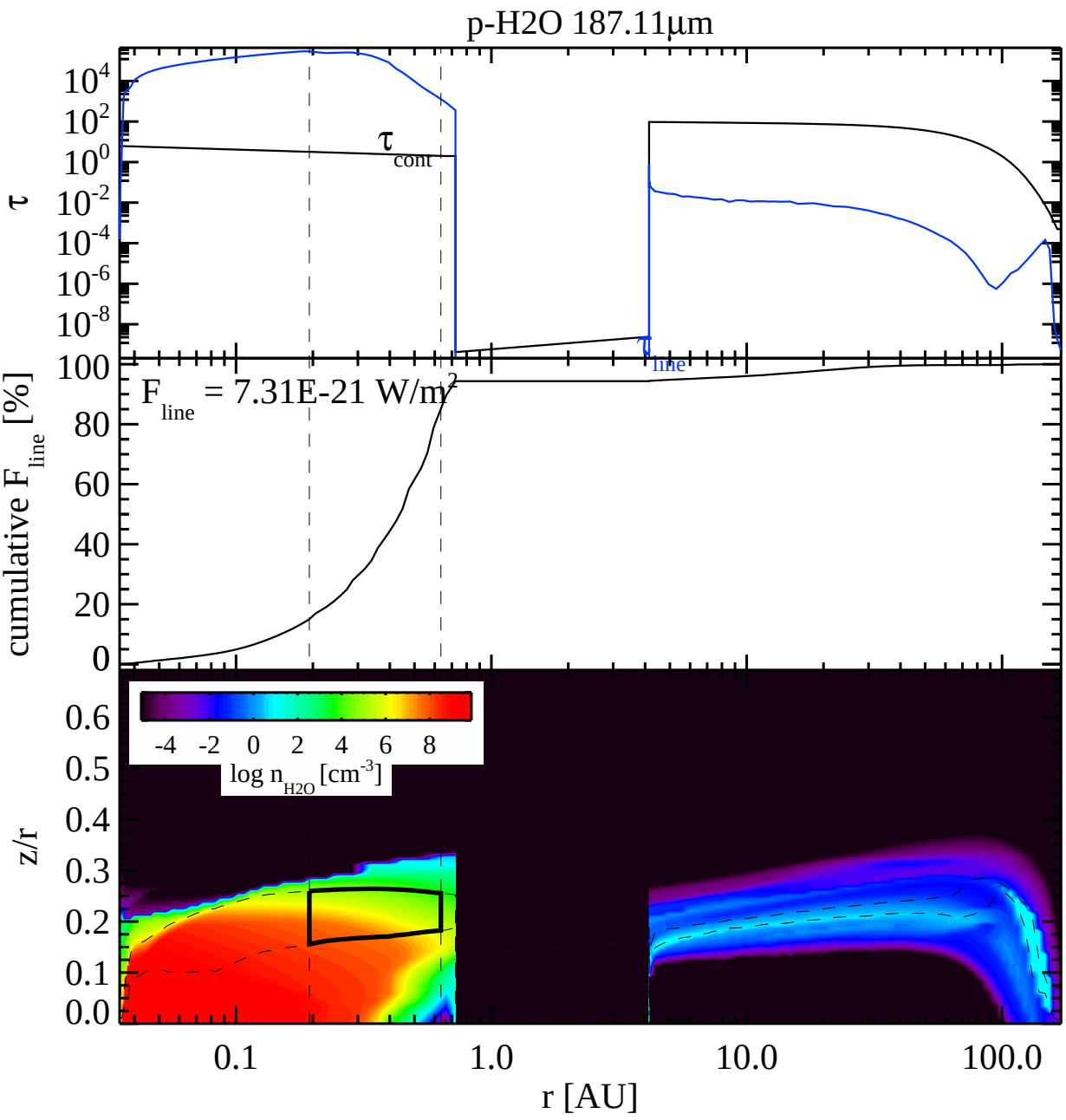

OH_H 27.39µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.64E-19 W/m2
log n OH [cm-3]
-6 -4 -2 0 2 4 6 8
z/r
r [AU]
0.1
1.0
10.0
100.0

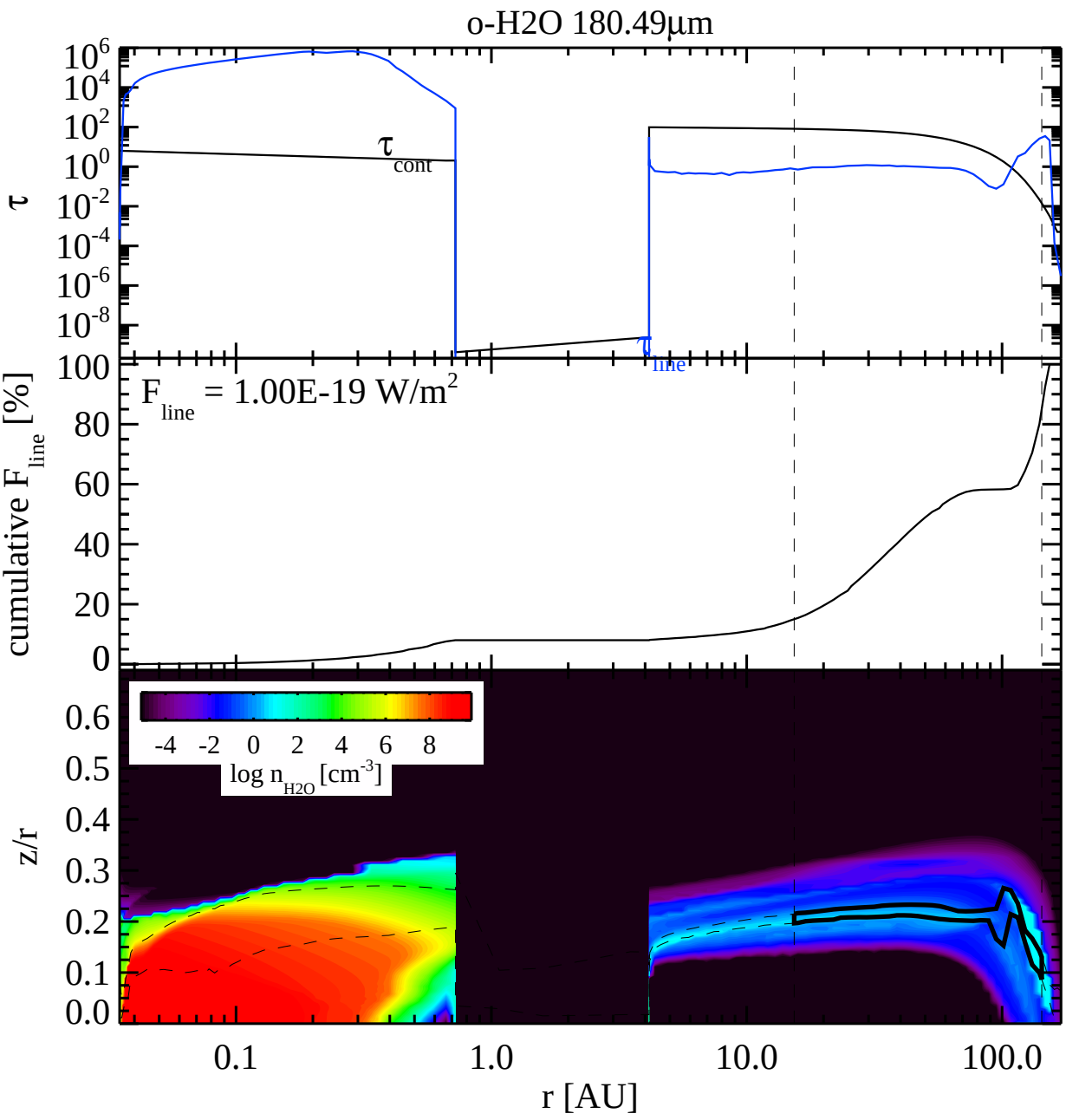

OH_H 30.28µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.70E-19 W/m2
log n OH [cm-3]
z/r
r [AU]

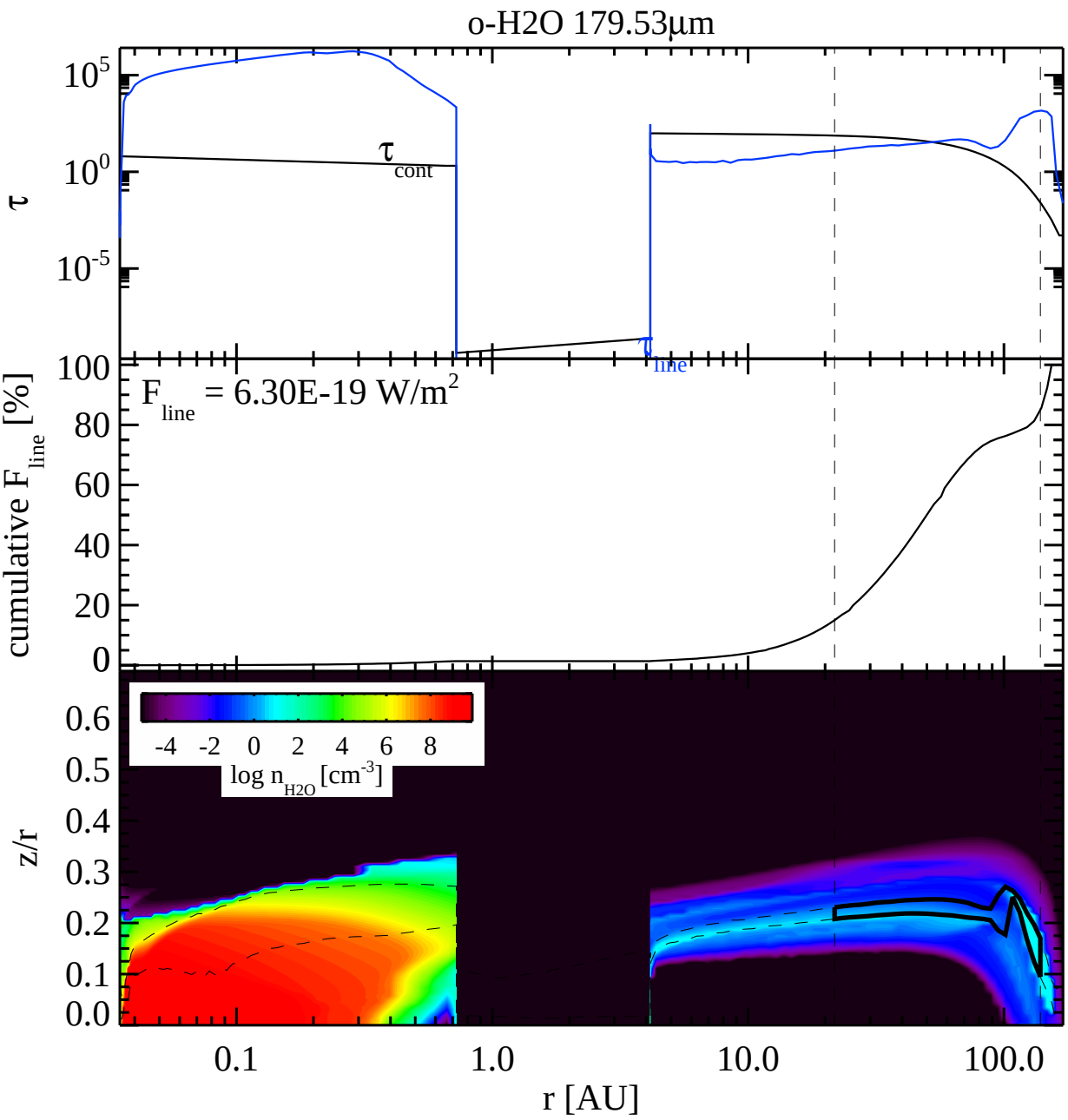

OH_H 33.88µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.63E-19 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6 8
log n_{OH} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

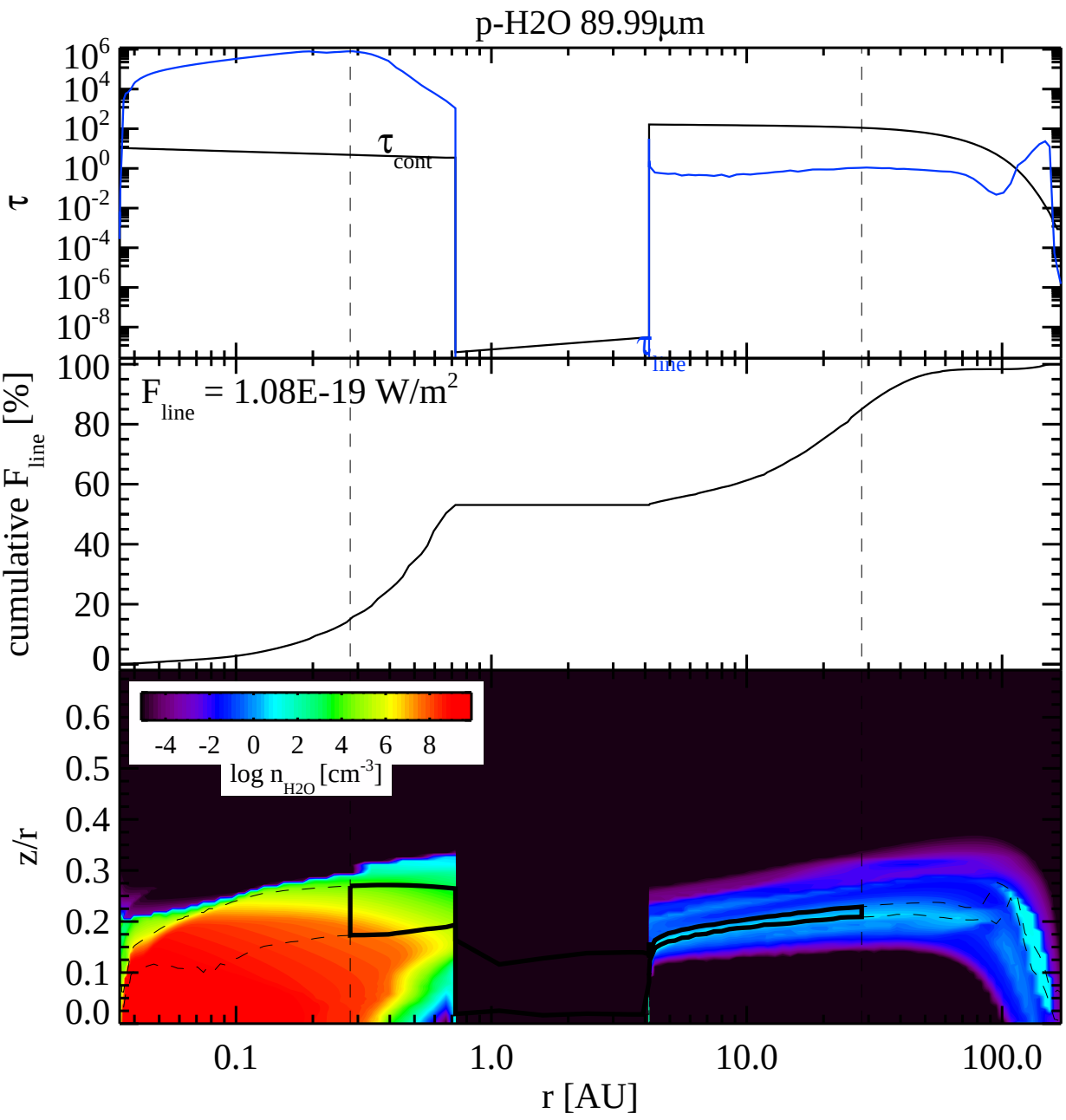

o-H2O 538.29µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 9.17E-20 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

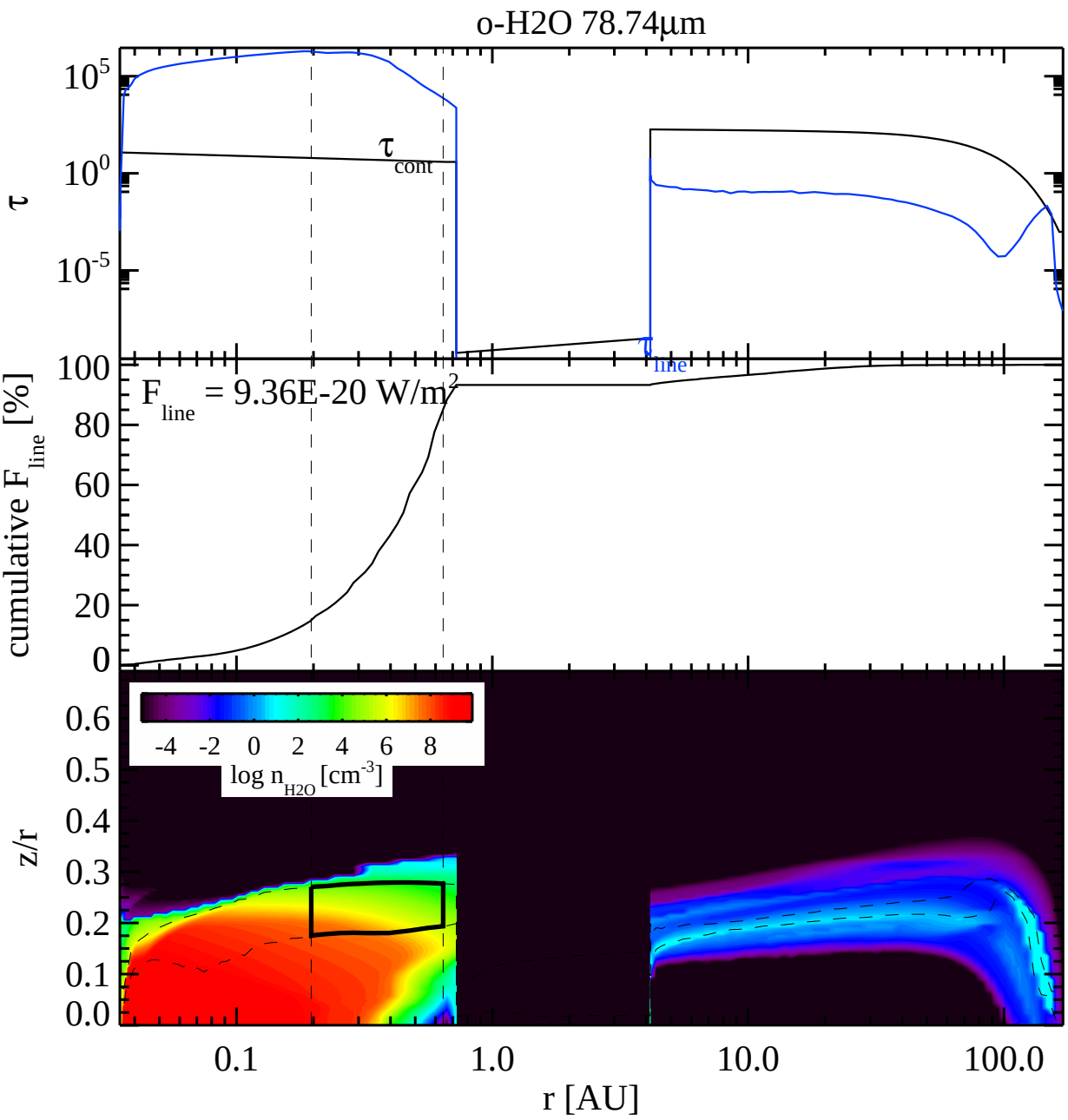

p-H2O 269.27µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 3.90E-19 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

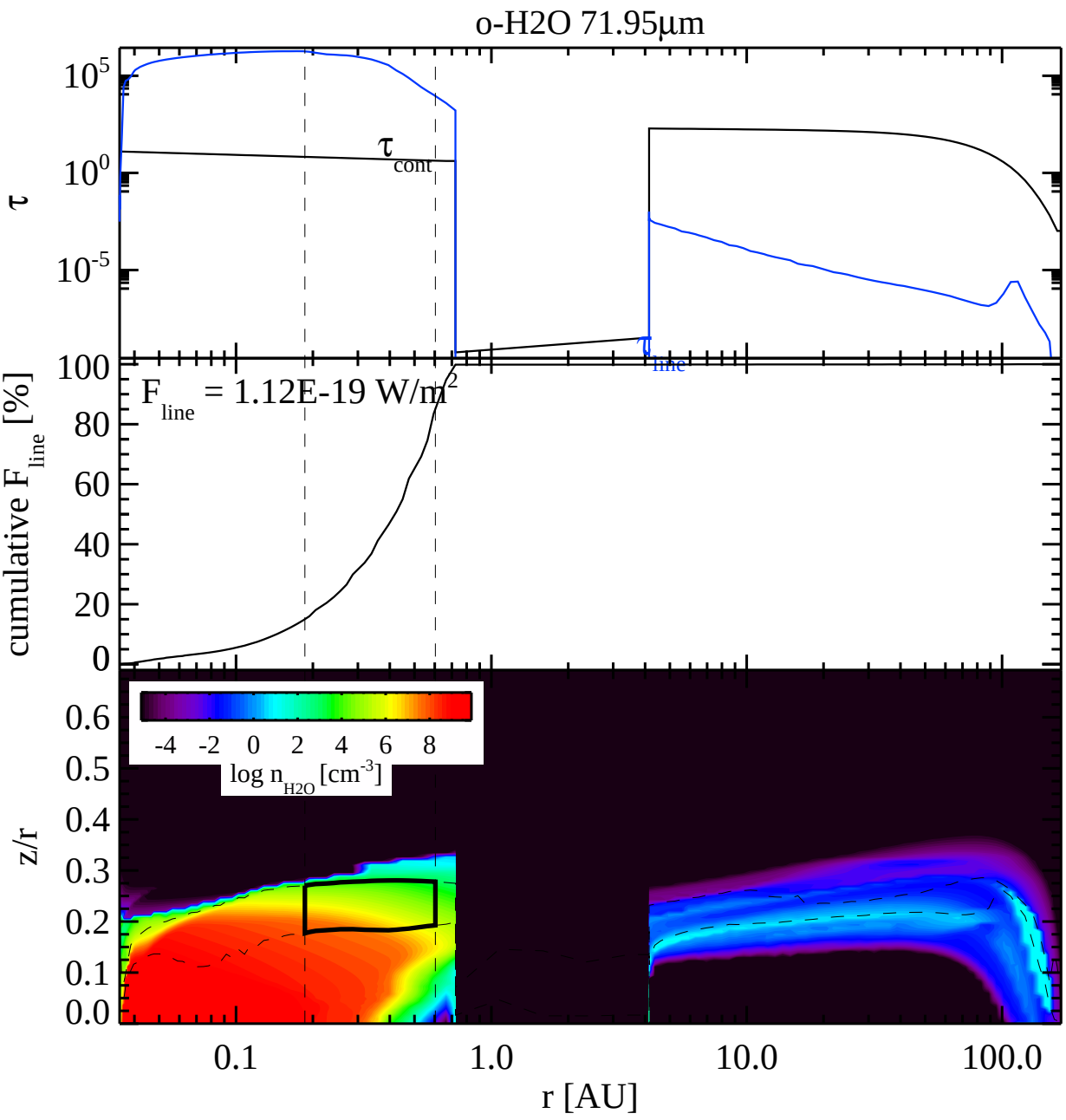

p-H2O 187.11µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 7.31E-21 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

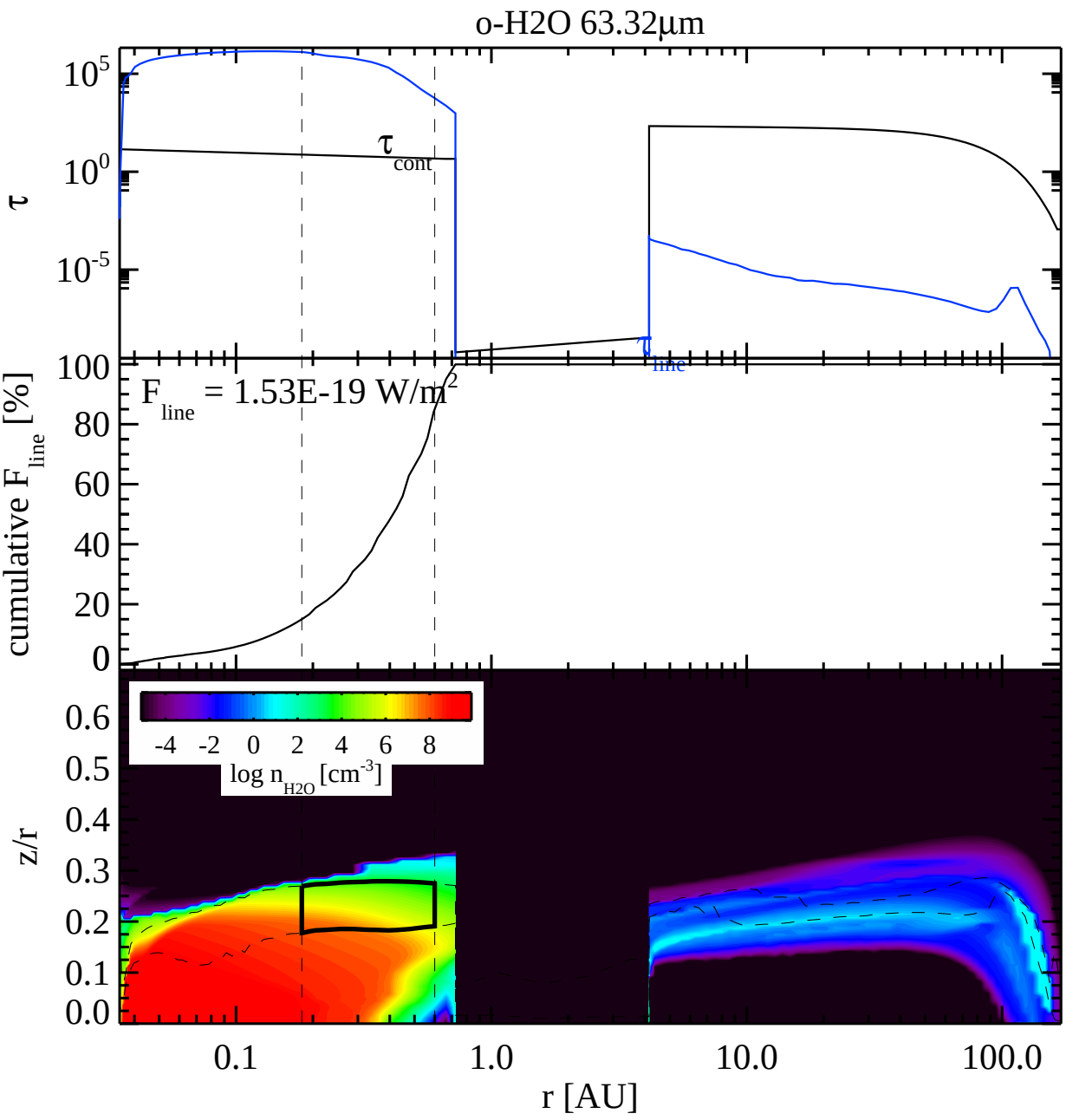

o-H2O 180.49µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.00E-19 W/m2
log n H2O [cm-3]
-4 -2 0 2 4 6 8
z/r
r [AU]
0.1
1.0
10.0
100.0

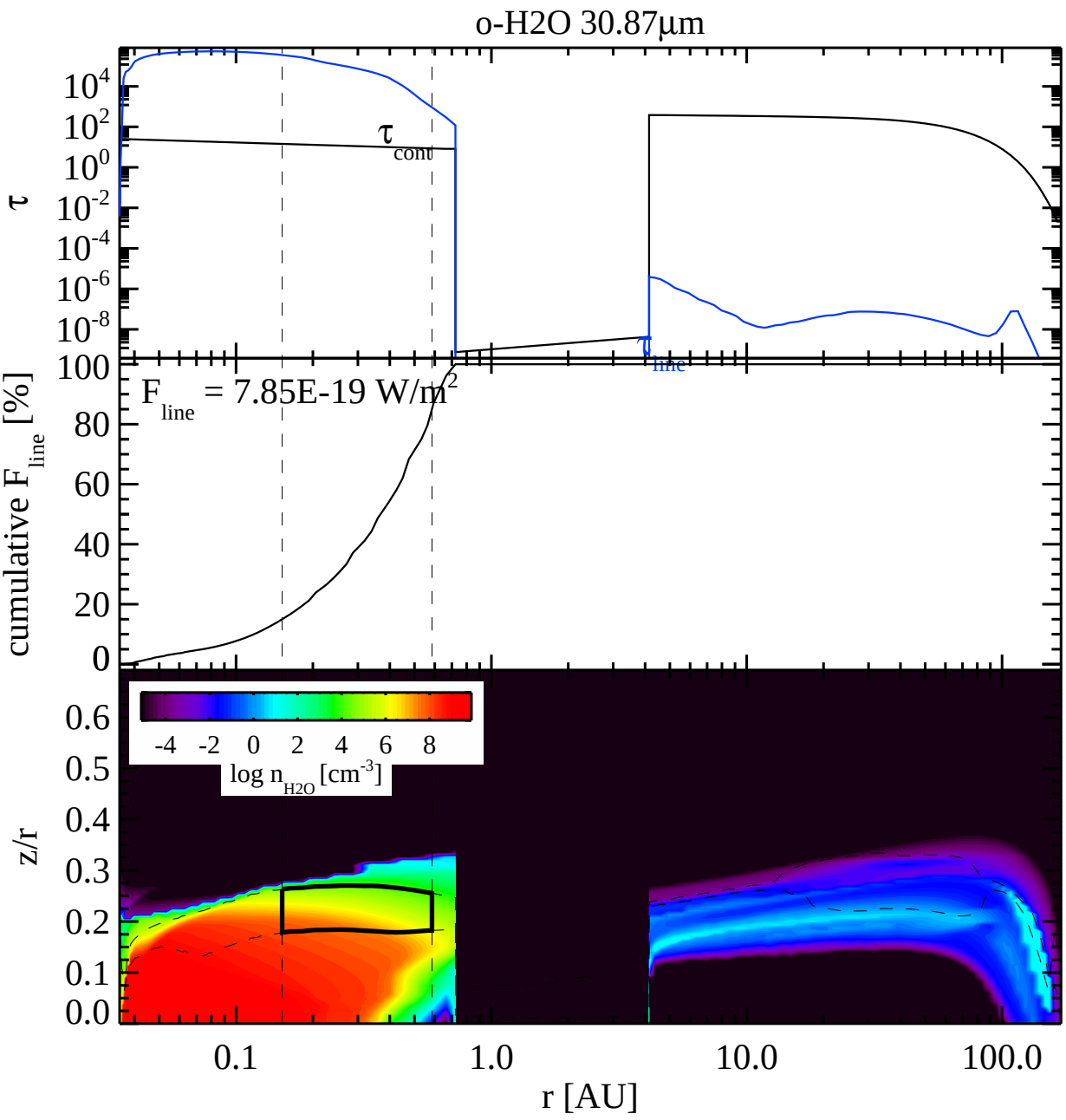

o-H2O 179.53µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 6.30E-19 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

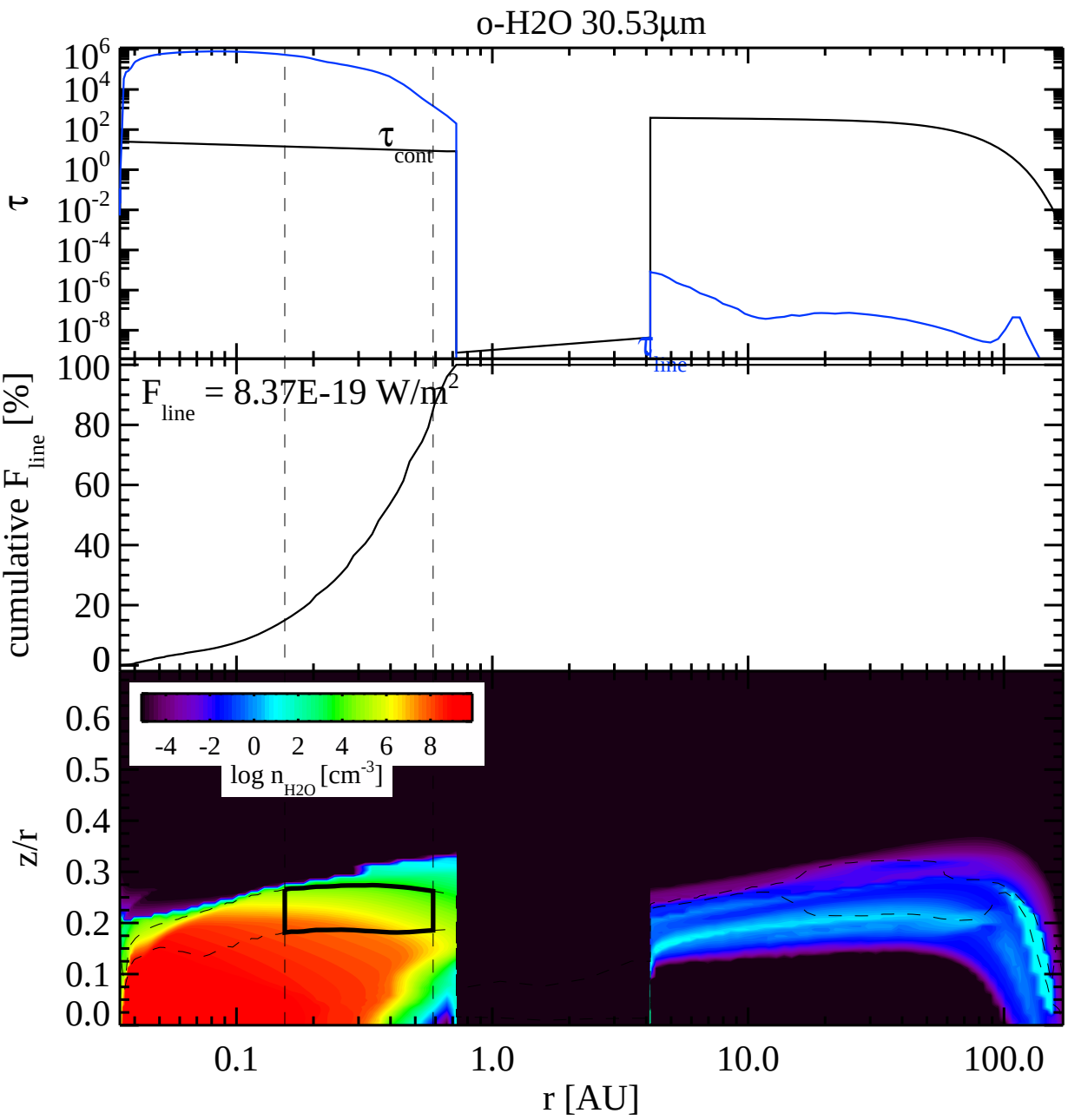

p-H2O 89.99µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.08E-19 W/m2
log n H2O [cm-3]
z/r
r [AU]

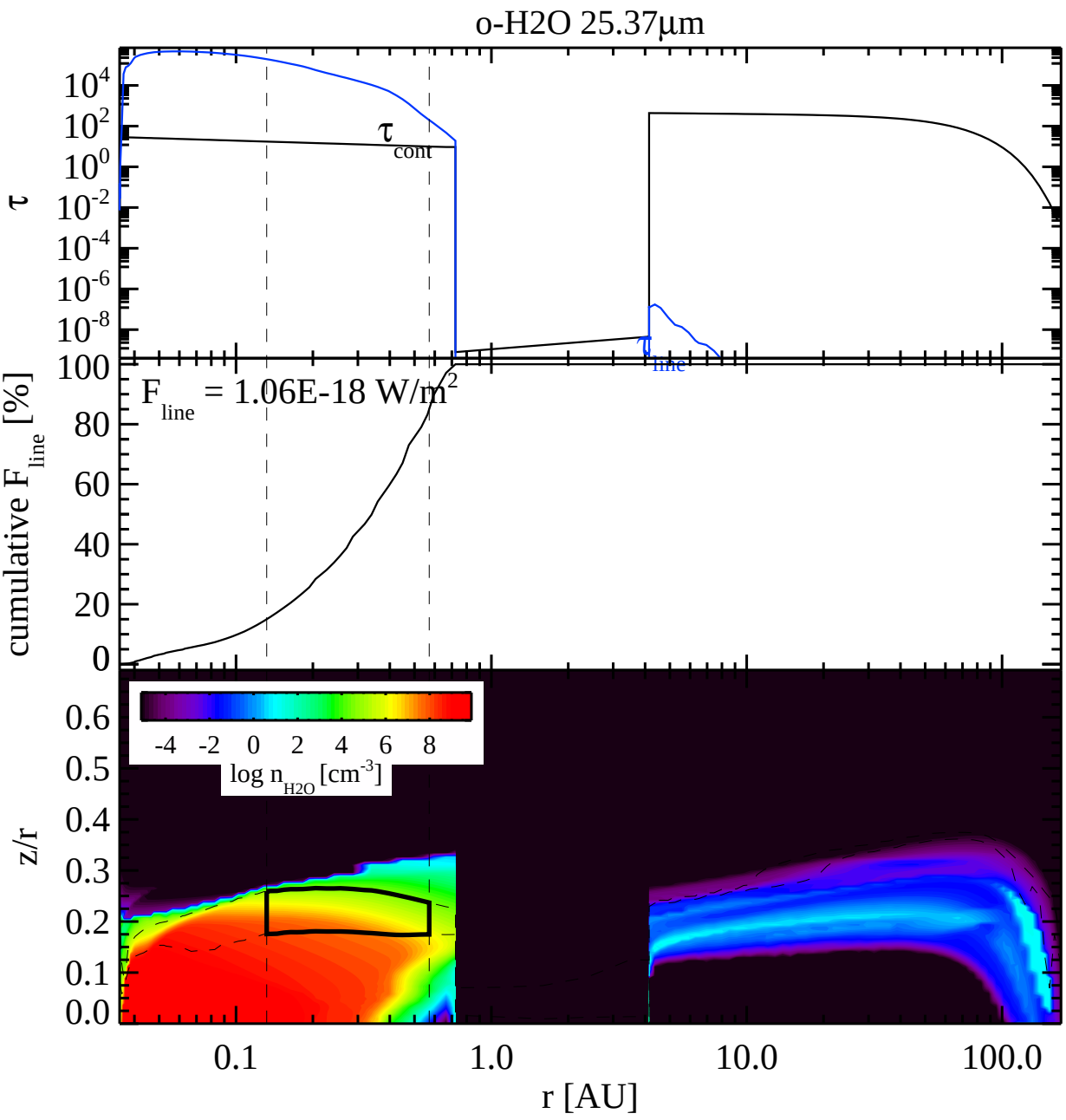

o-H2O 78.74µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 9.36E-20 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

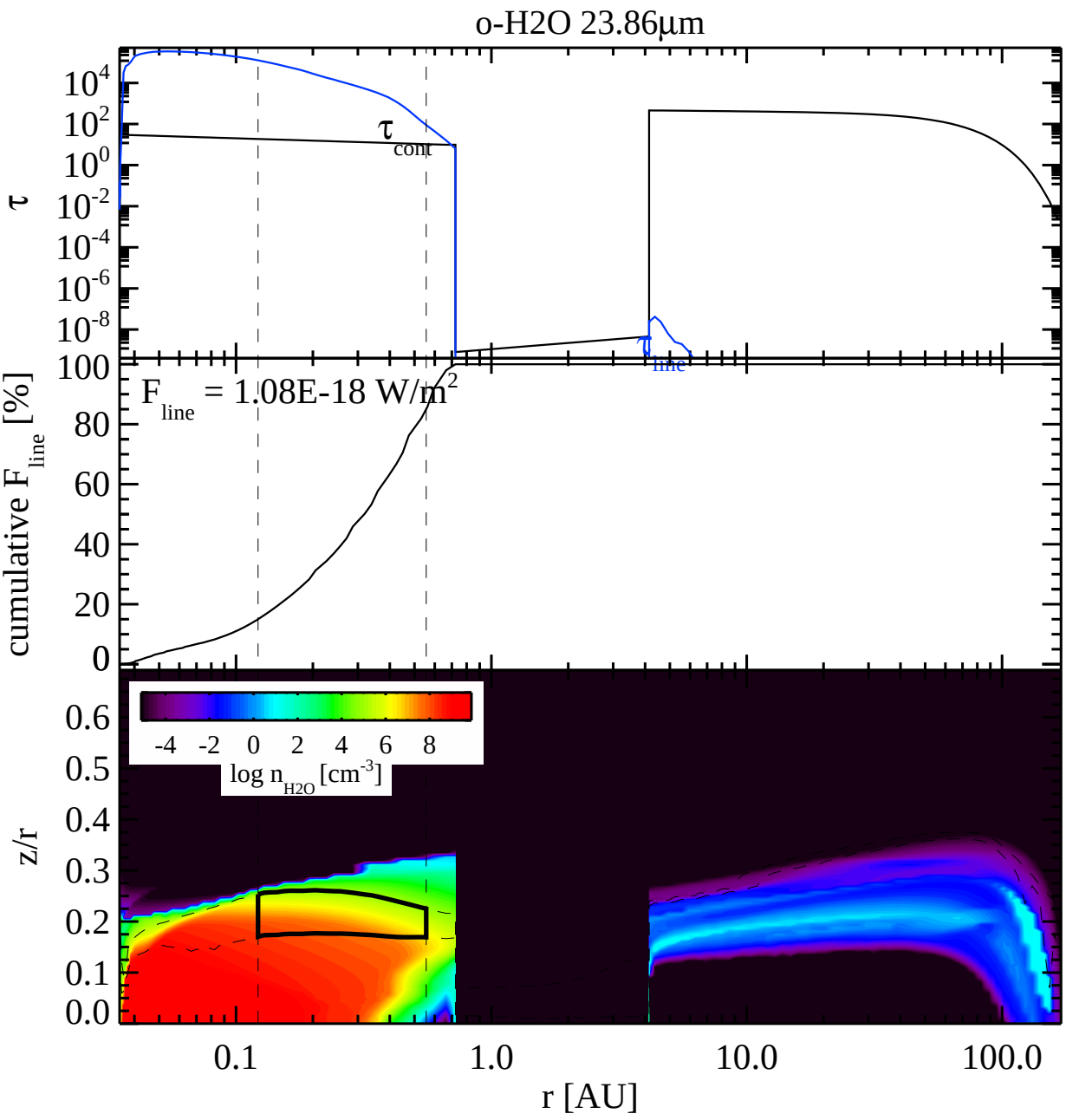

o-H2O 71.95µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.12E-19 W/m^2
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

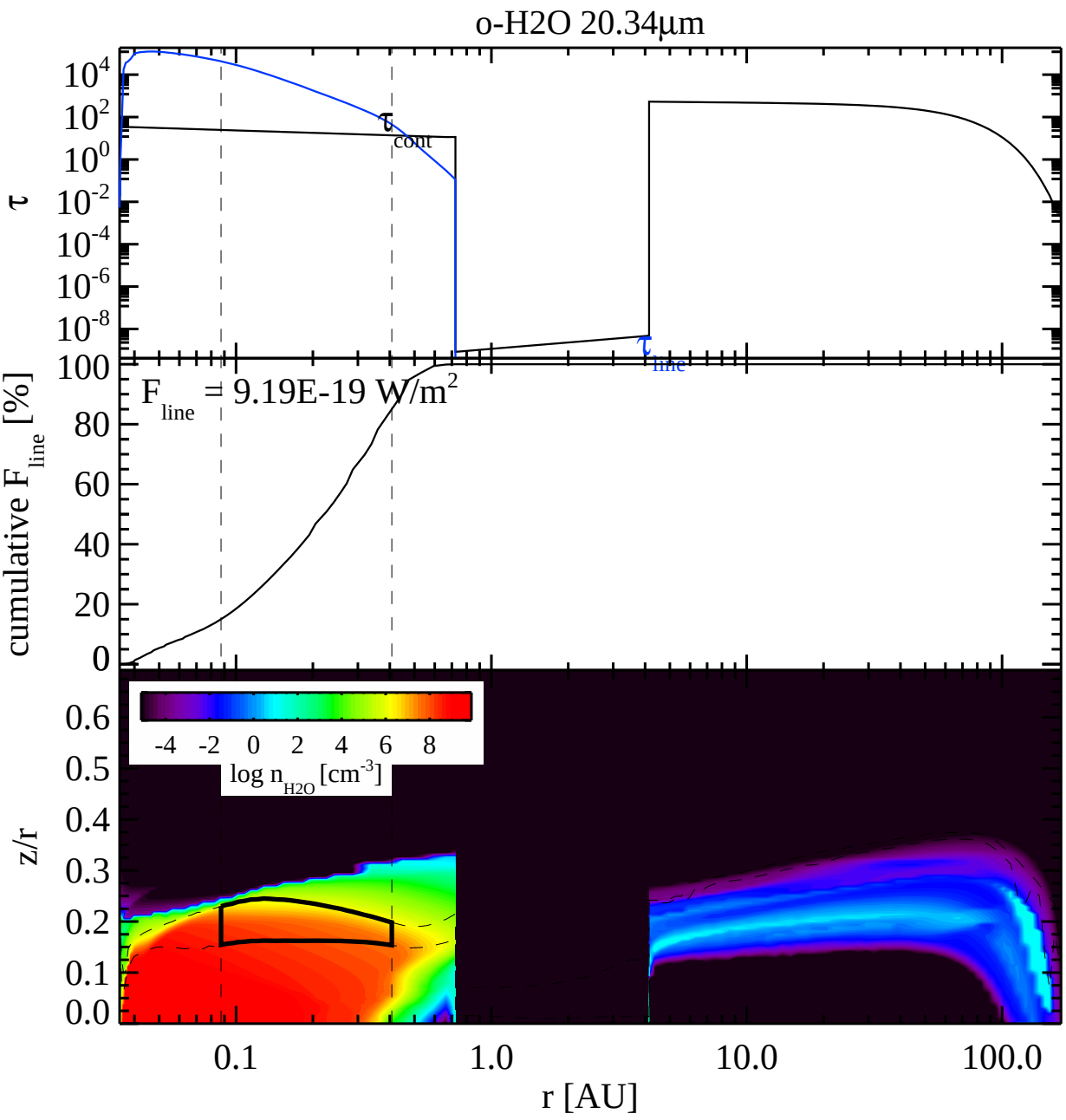

o-H2O 63.32µm
τ
10^5
10^0
10^{-5}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.53E-19 W/m^2
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

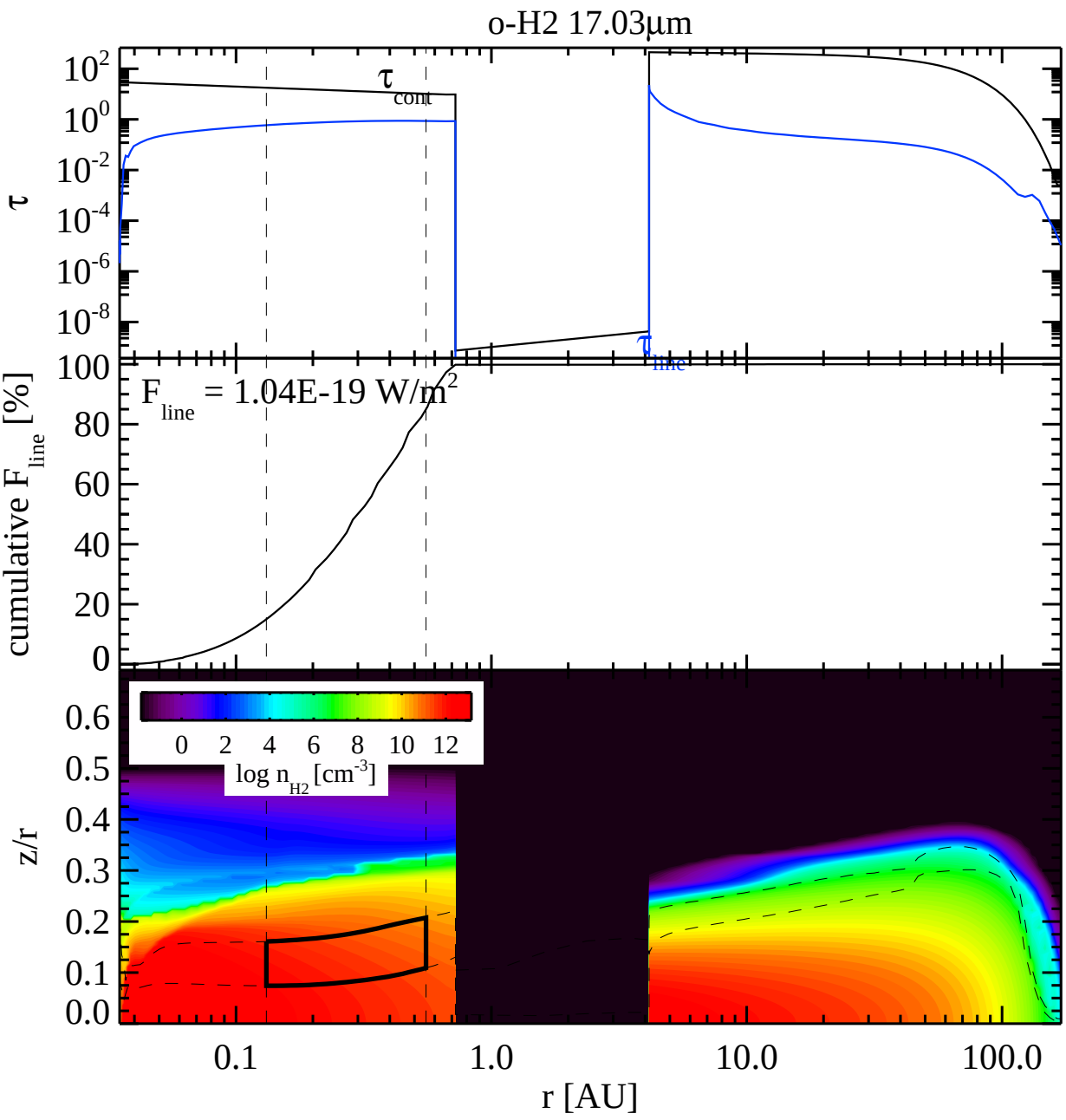

o-H2O 30.87µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 7.85E-19 W/m^2
100
80
60
40
20
0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

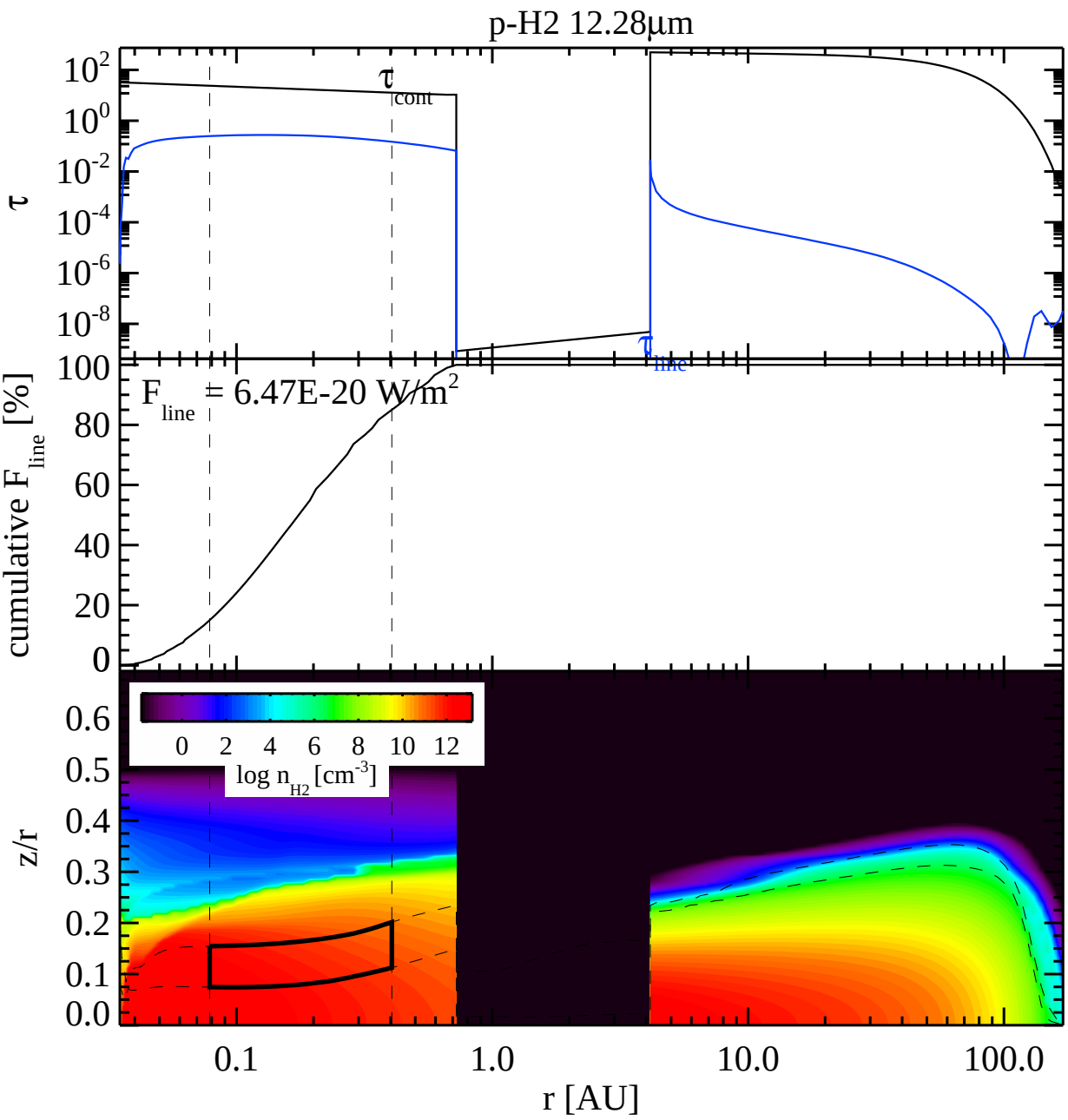

o-H2O 30.53µm
τ
10^{6}
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 8.37E-19 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

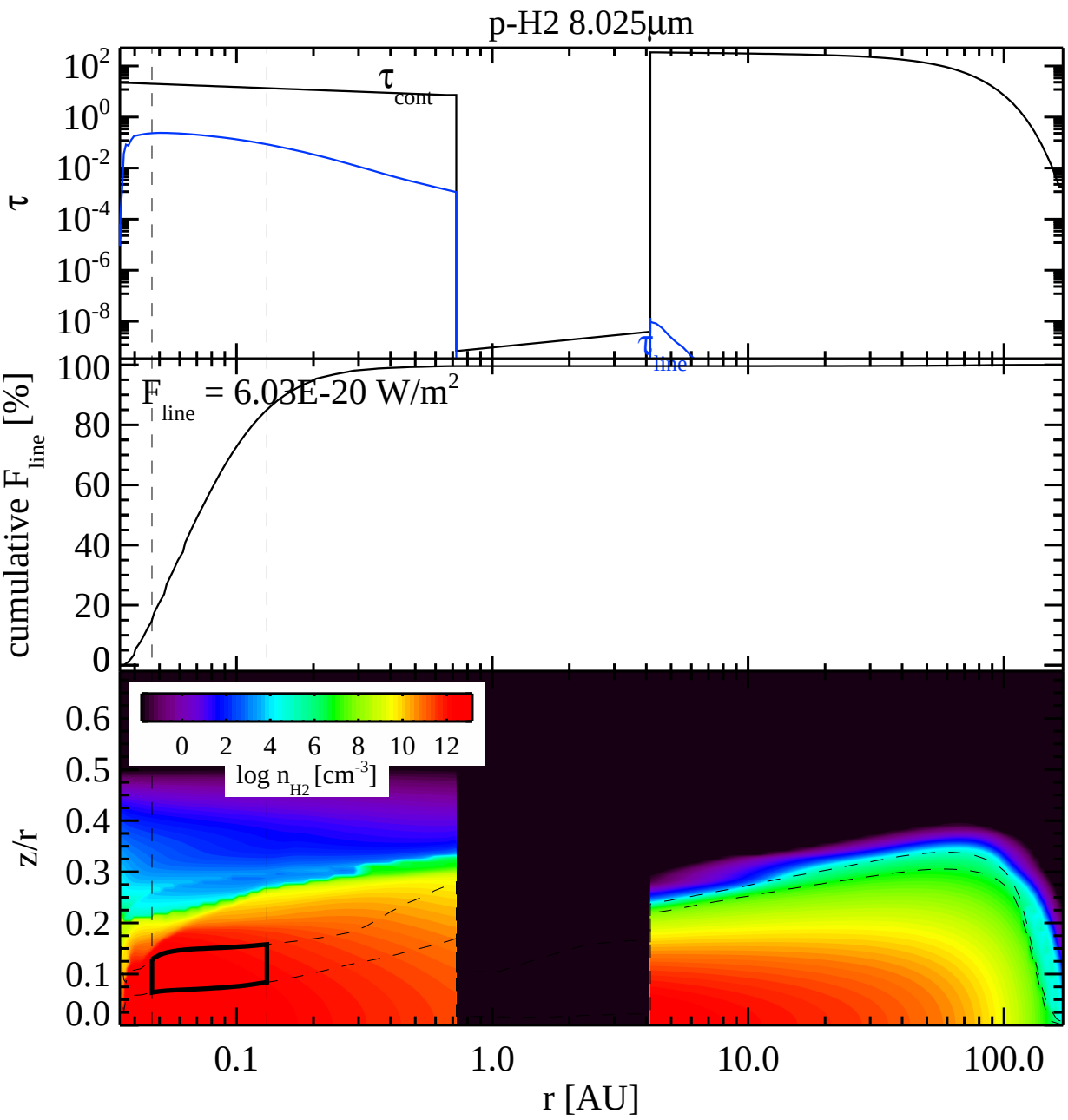

o-H2O 25.37µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 1.06E-18 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

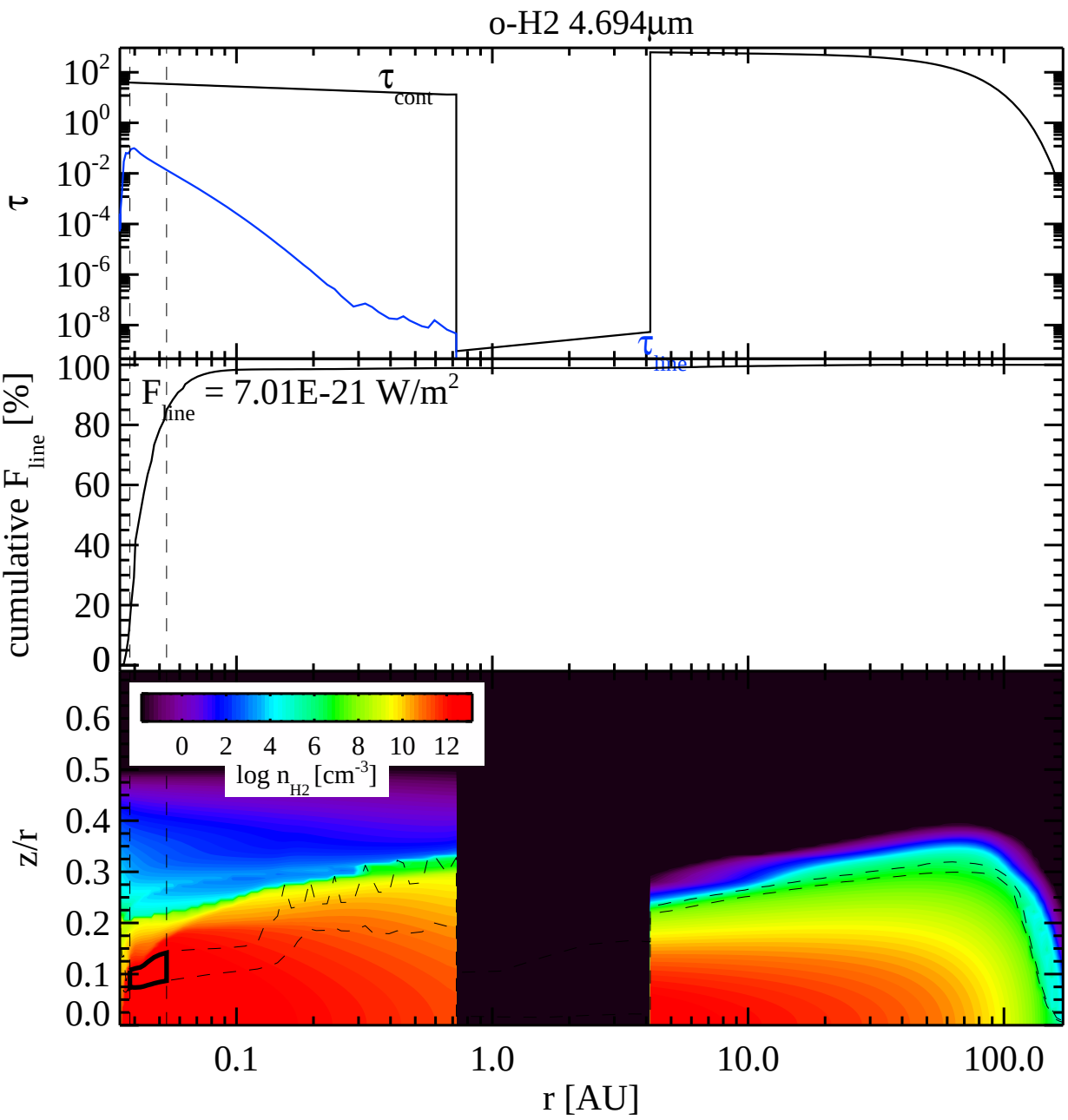

o-H2O 23.86µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 1.08E-18 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
0.1
1.0
10.0
100.0
r [AU]

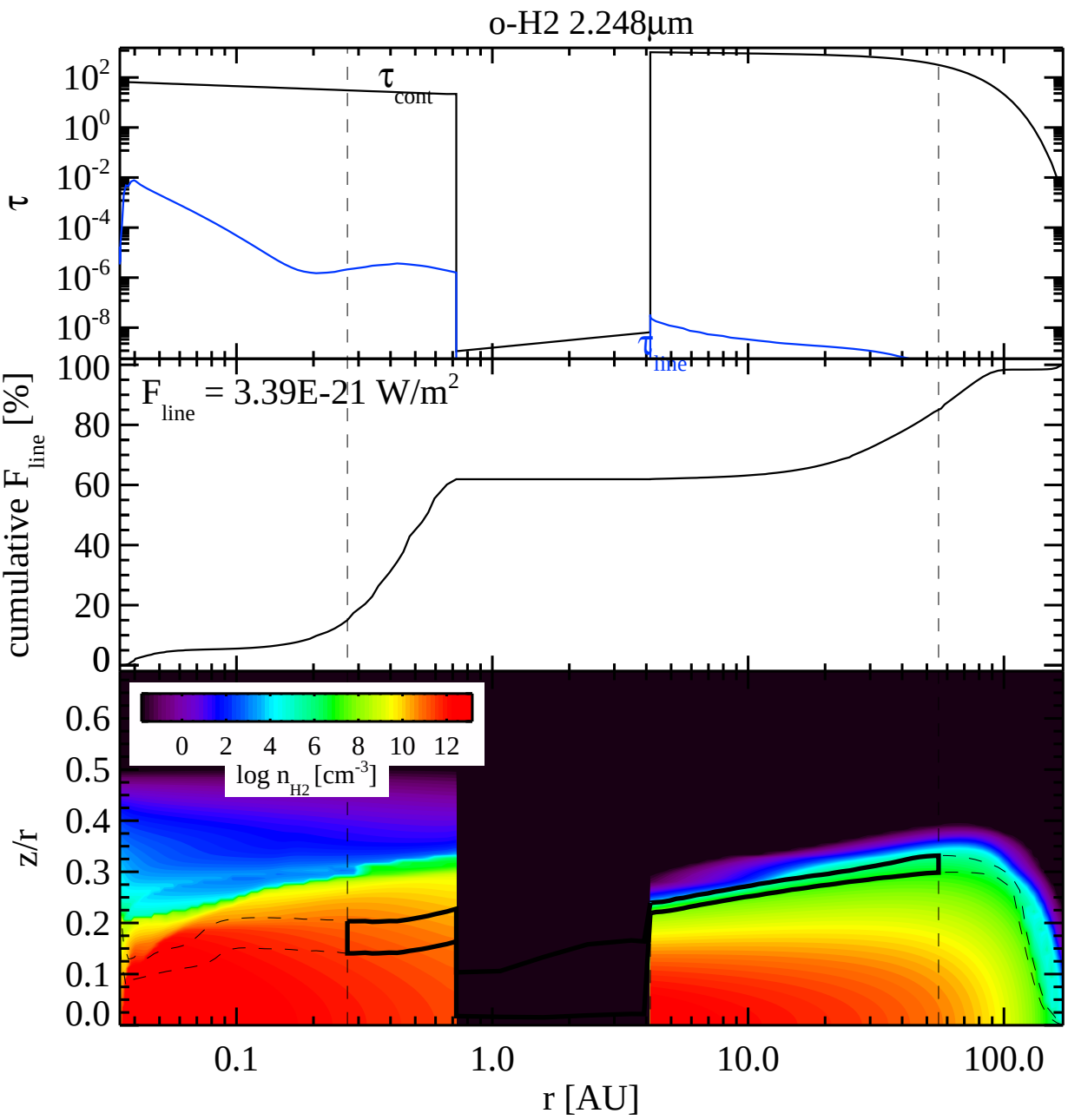

o-H2O 20.34µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 9.19E-19 W/m^2
-4 -2 0 2 4 6 8
log n_{H2O} [cm^{-3}]
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.1
1.0
10.0
100.0
r [AU]

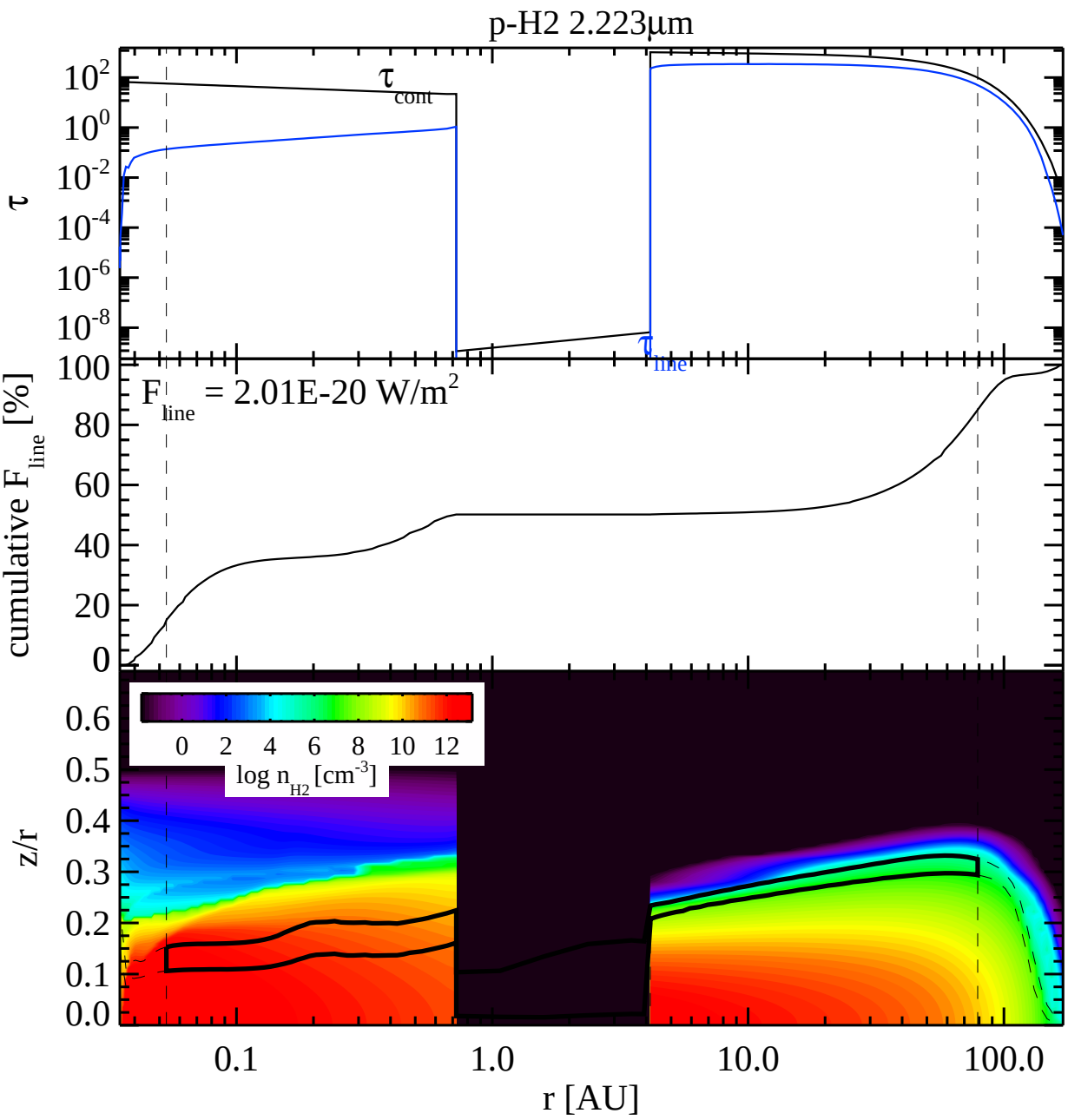

o-H2 17.03µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.04E-19 W/m2
log n H2 [cm-3]
z/r
r [AU]

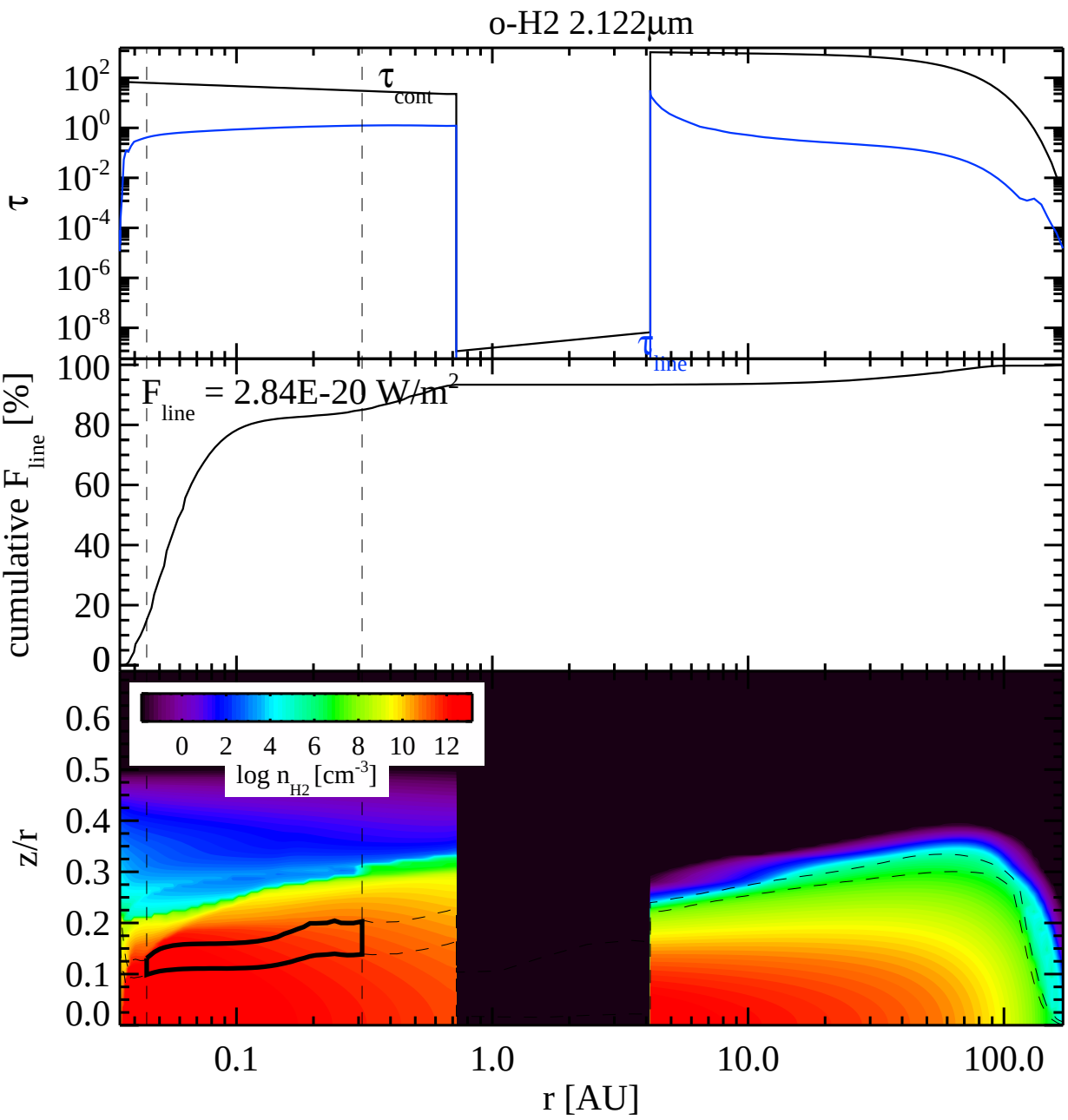

p-H2 12.28µm
τ
τ cont
τ line
cumulative F line [%]
F line = 6.47E-20 W/m2
log n H2 [cm-3]
z/r
r [AU]

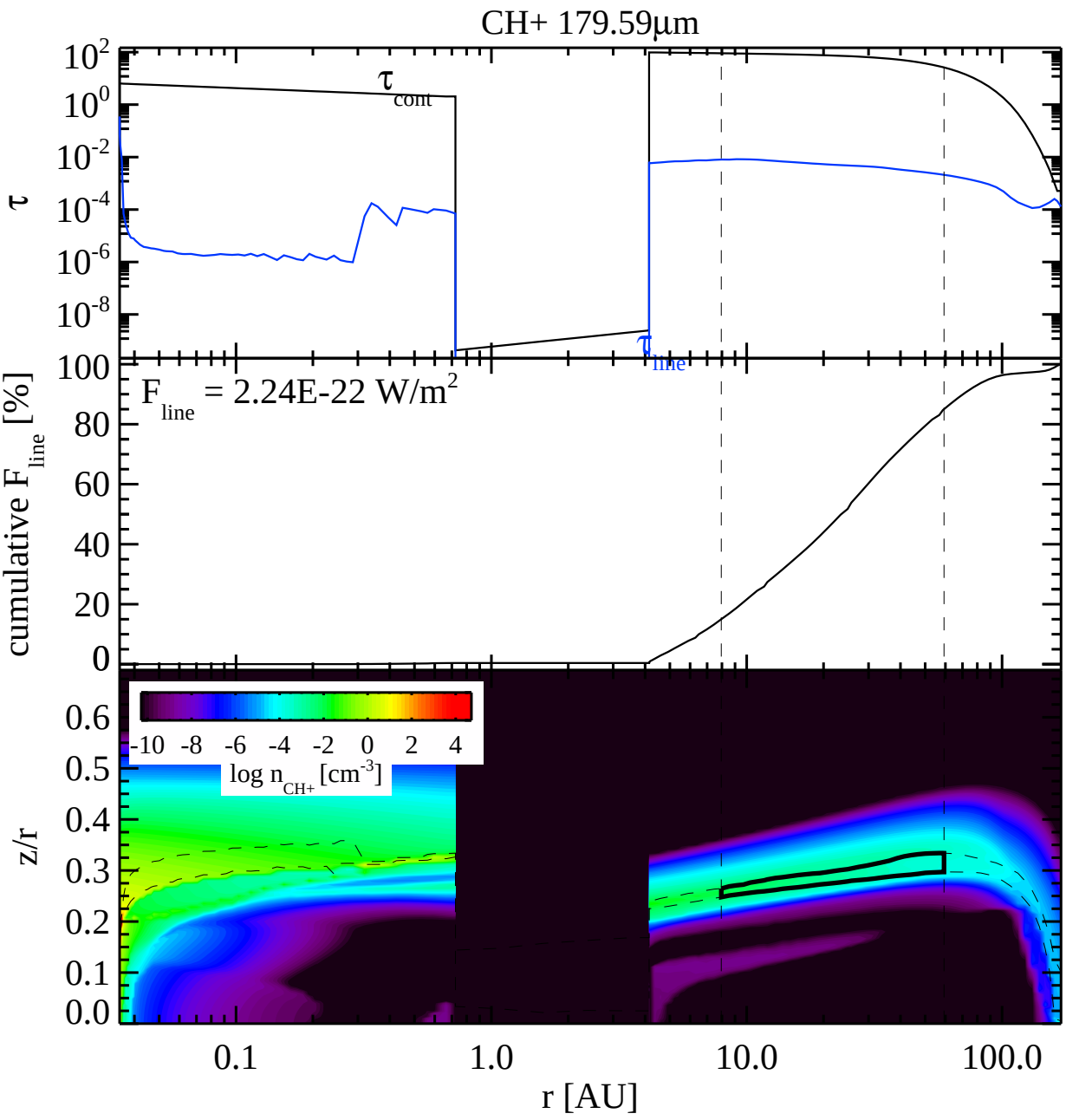

p-H2 8.025µm
τ
τ cont
τ line
cumulative F line [%]
F line = 6.03E-20 W/m2
log n H2 [cm-3]
0 2 4 6 8 10 12
z/r
r [AU]
0.1
1.0
10.0
100.0

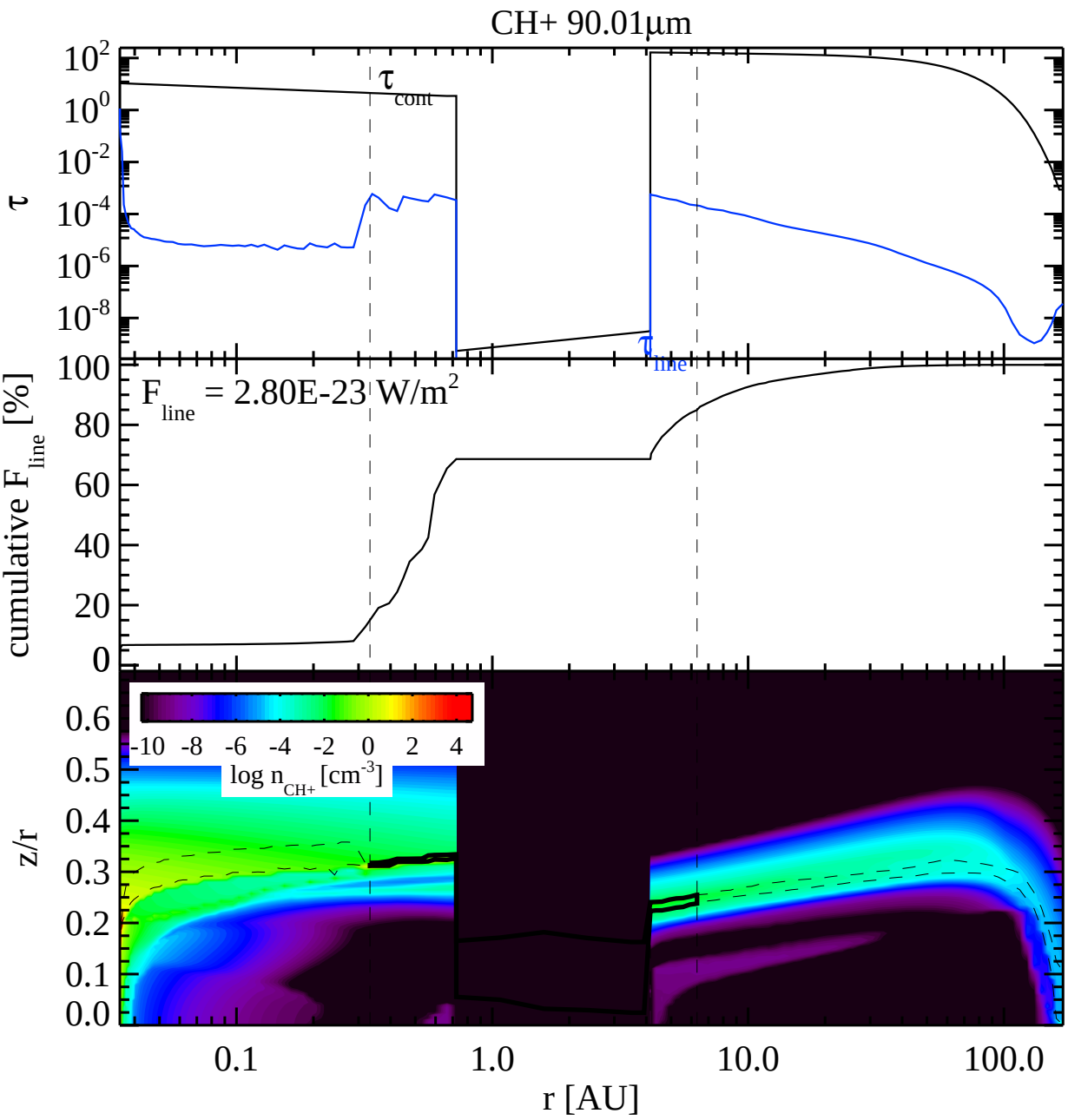

o-H2 4.694µm
τ
τ cont
τ line
cumulative F line [%]
F line = 7.01E-21 W/m2
z/r
log n H2 [cm-3]
0 2 4 6 8 10 12
r [AU]
0.1
1.0
10.0
100.0

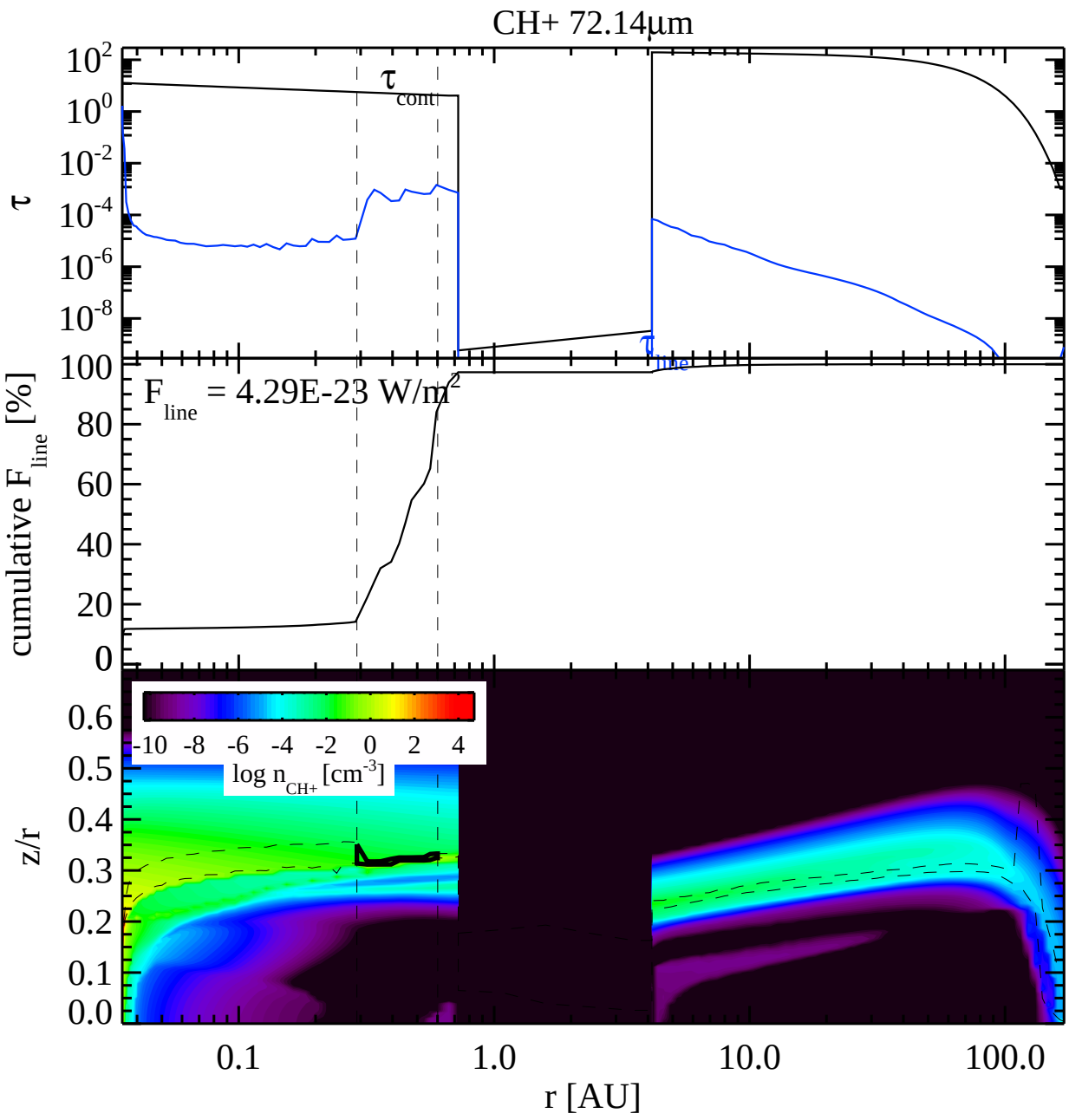

o-H2 2.248µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.39E-21 W/m2
log n H2 [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

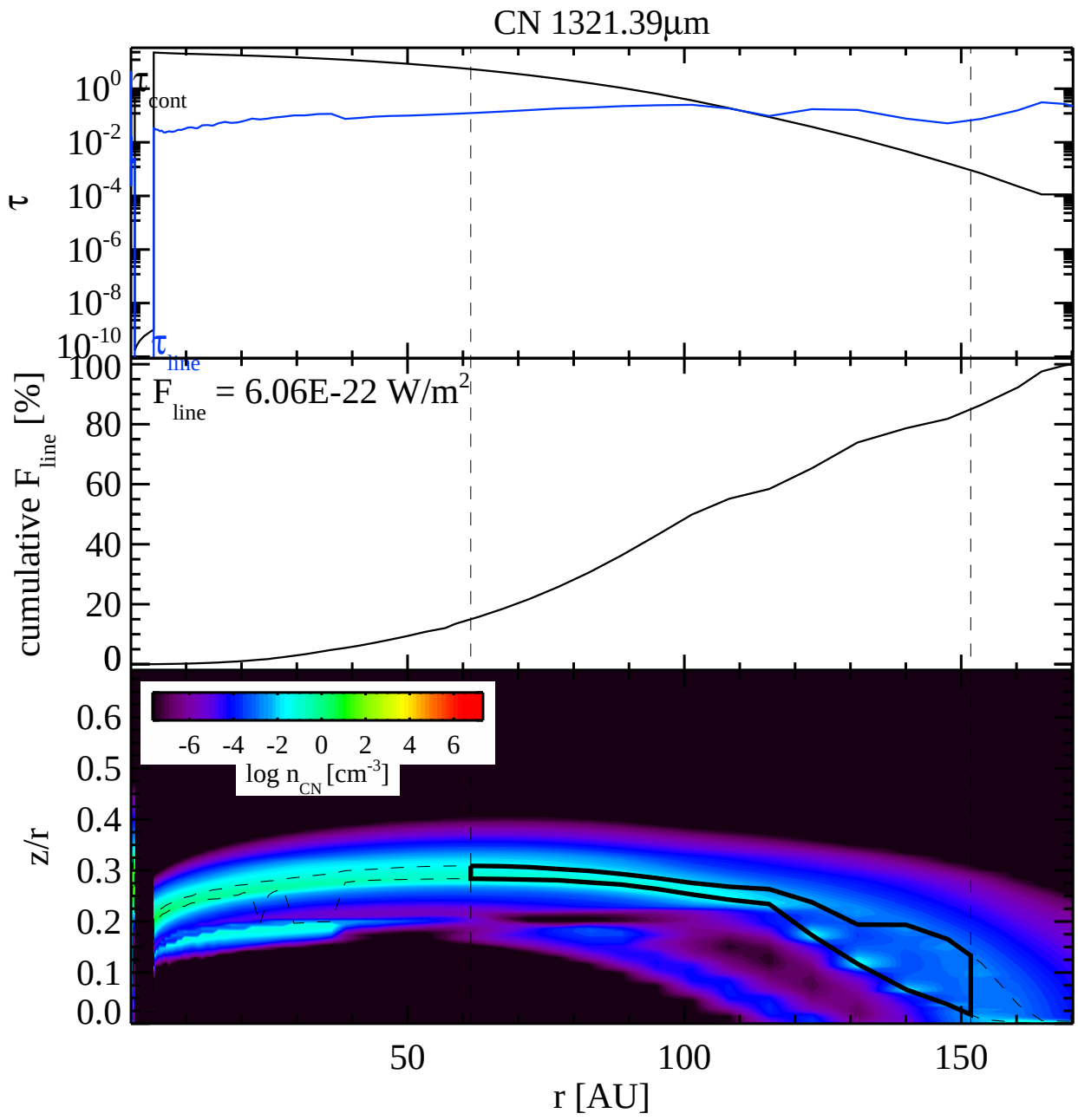

p-H2 2.223µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.01E-20 W/m2
log n H2 [cm-3]
z/r
r [AU]
0.1
1.0
10.0
100.0

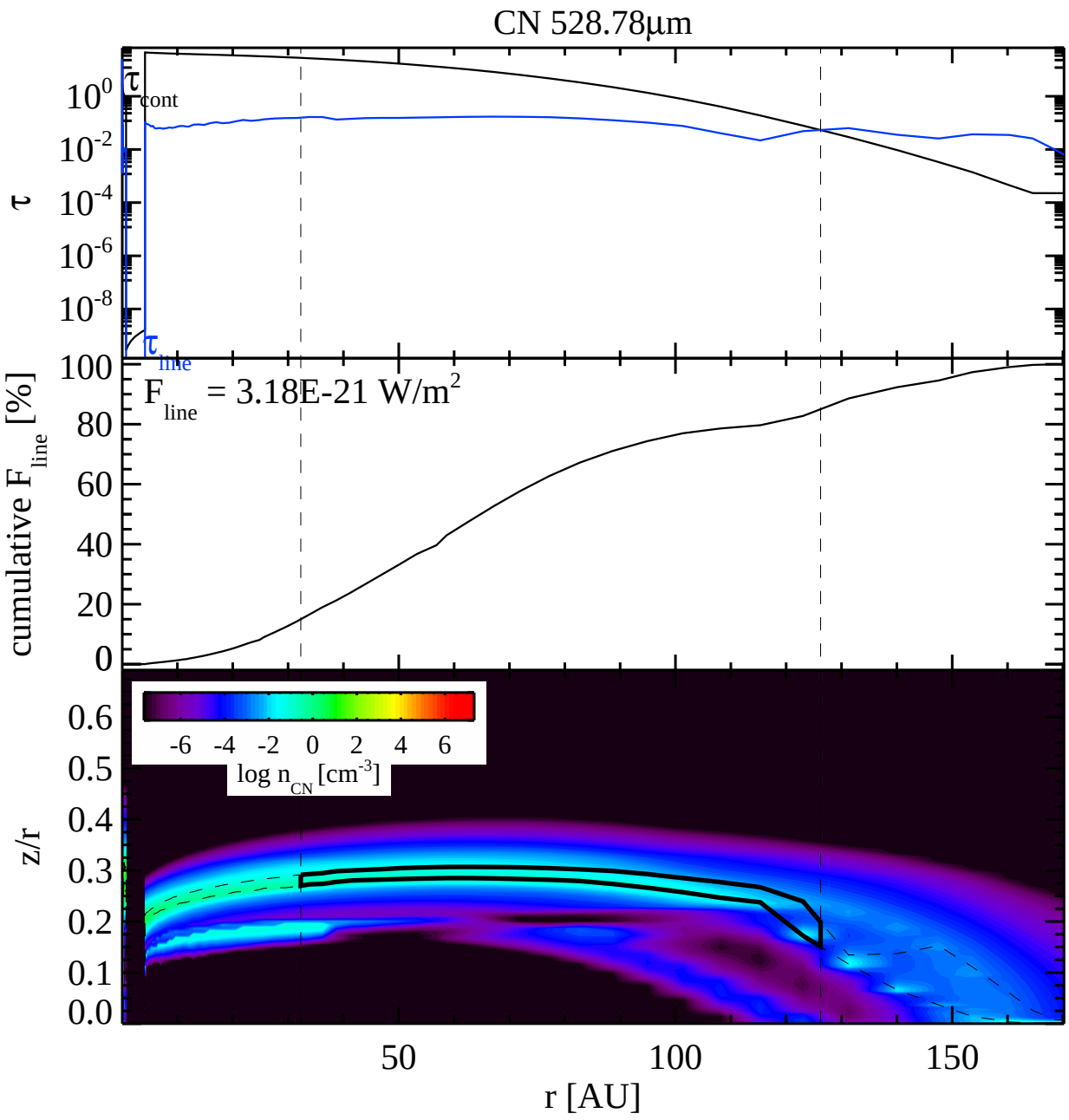

o-H2 2.122µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.84E-20 W/m2
log n H2 [cm-3]
z/r
r [AU]

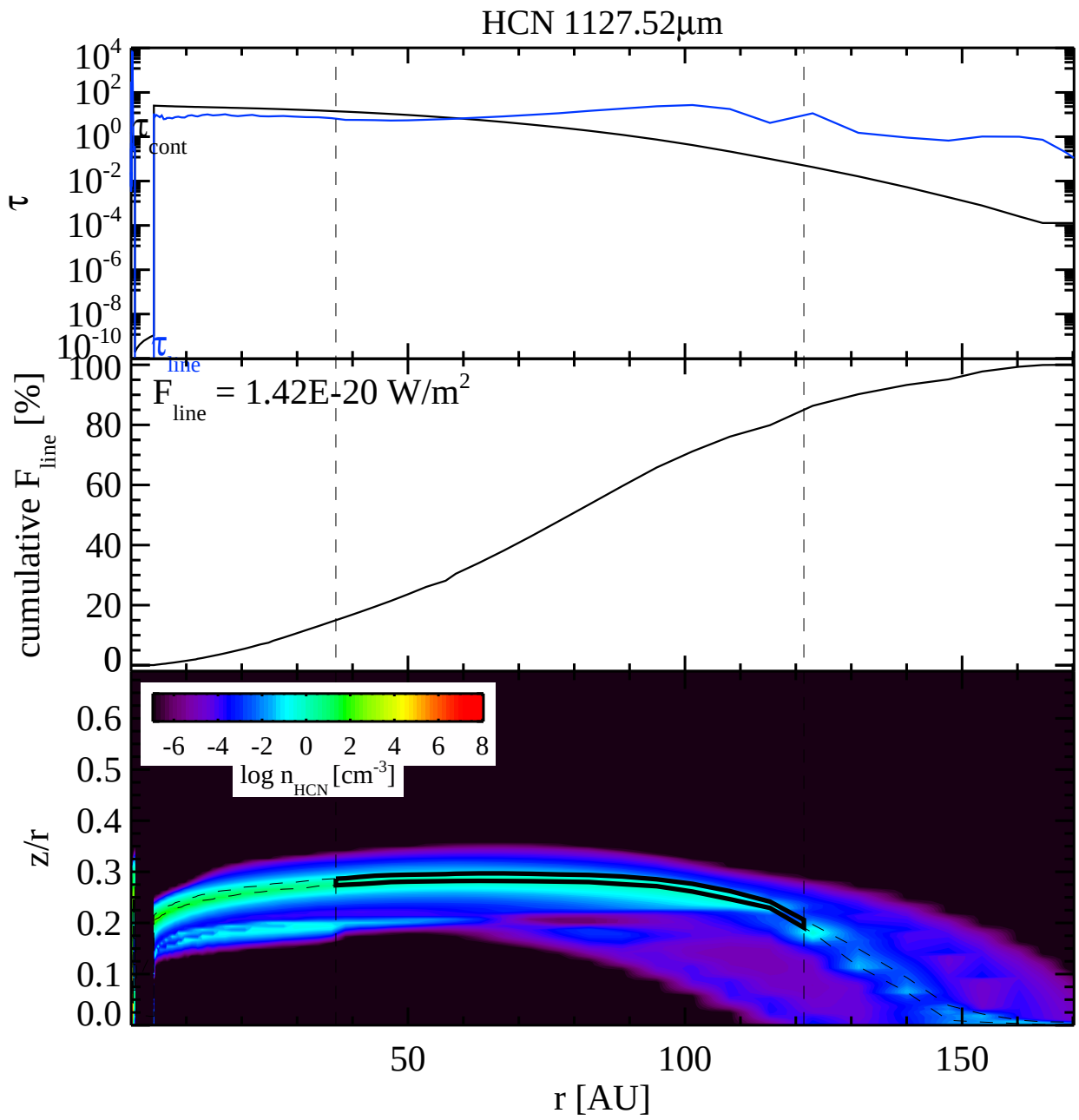

CH+ 179.59µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.24E-22 W/m2
z/r
log n CH+ [cm-3]
r [AU]

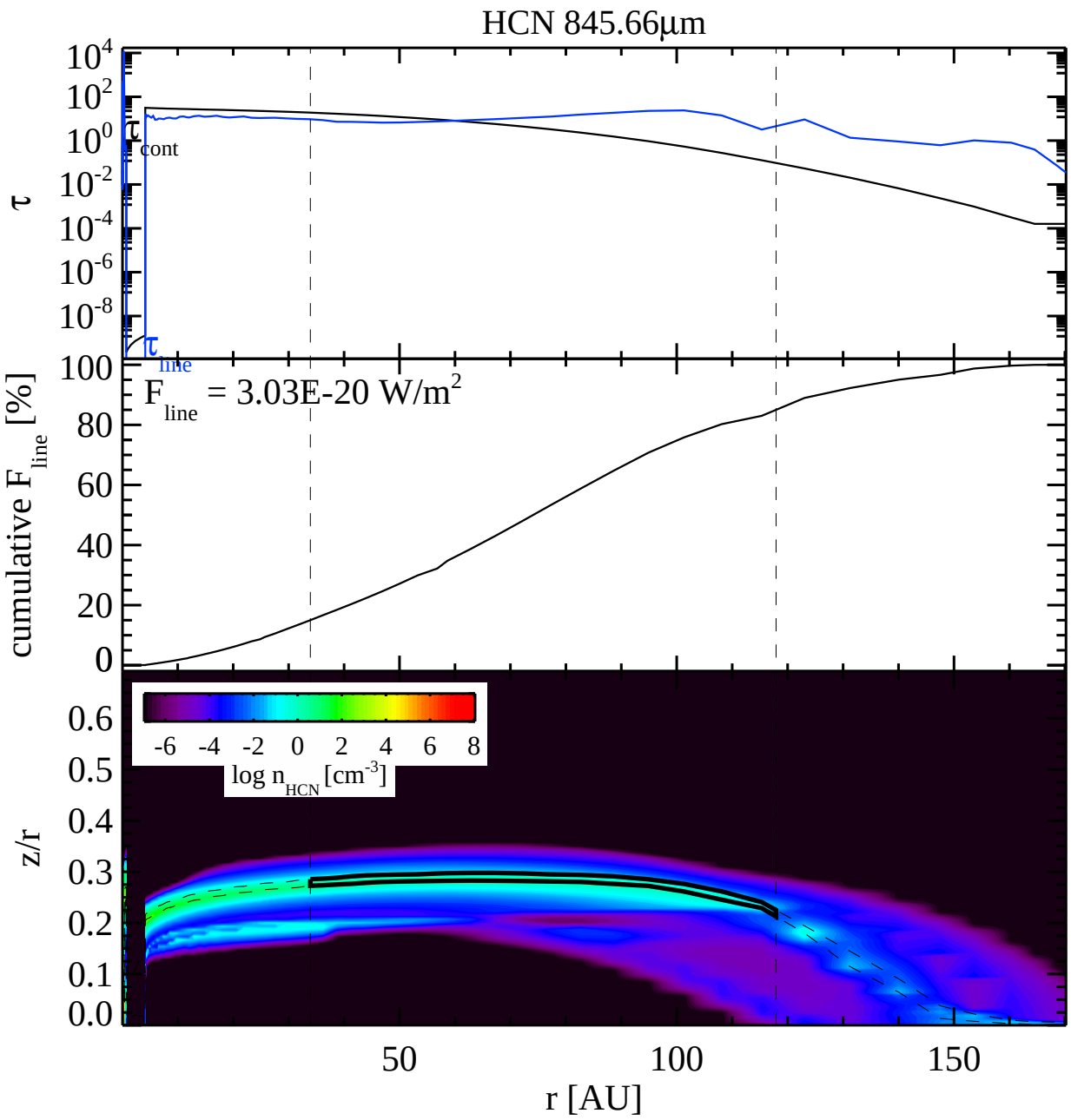

CH+ 90.01µm
τ
τ cont
τ line
cumulative F line [%]
F line = 2.80E-23 W/m2
z/r
log n CH+ [cm-3]
-10 -8 -6 -4 -2 0 2 4
r [AU]
0.1
1.0
10.0
100.0

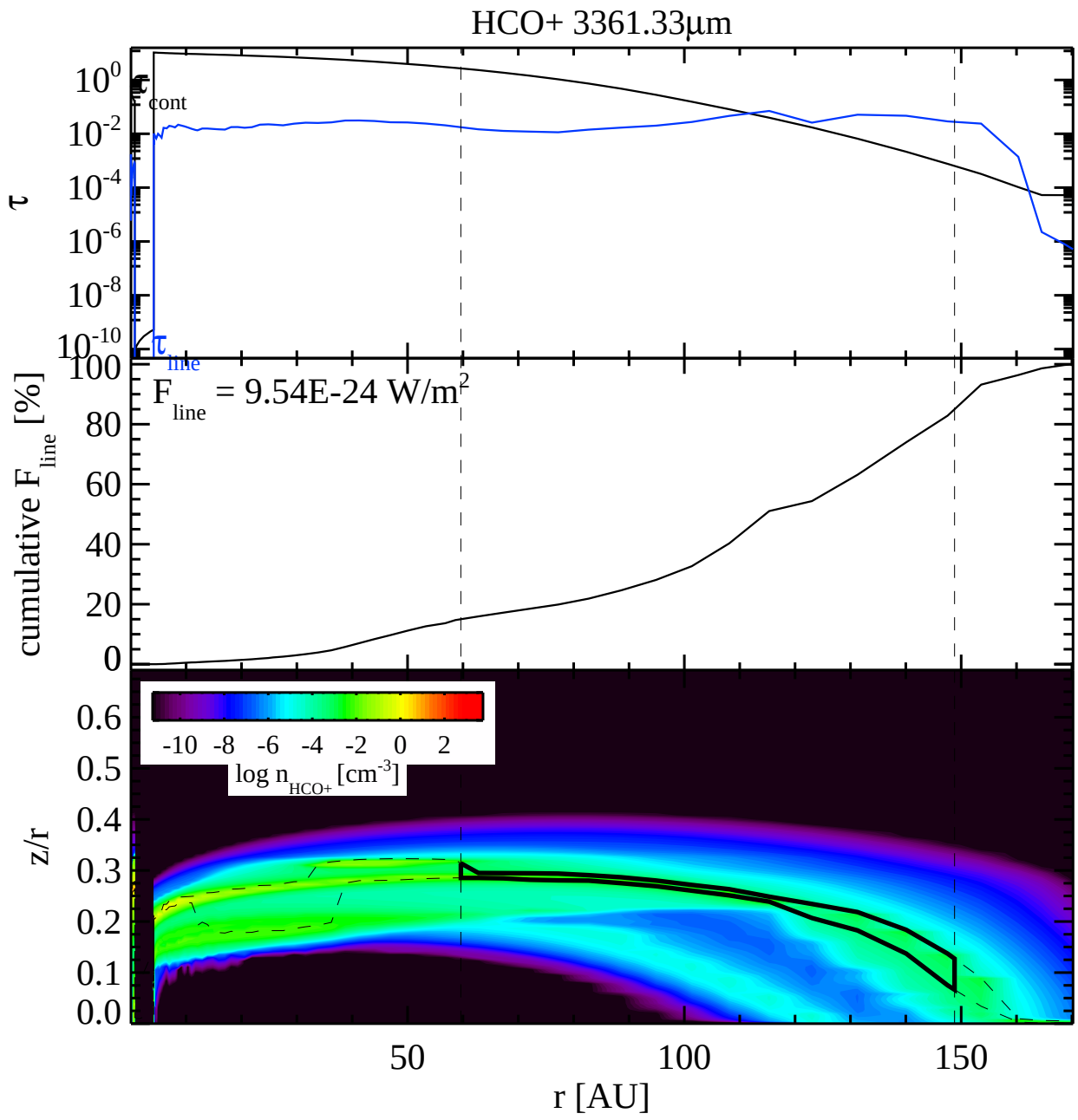

CH+ 72.14μm
τ
τ cont
τ line
cumulative F line [%]
F line = 4.29E-23 W/m2
z/r
log n CH+ [cm-3]
-10 -8 -6 -4 -2 0 2 4
r [AU]
0.1
1.0
10.0
100.0

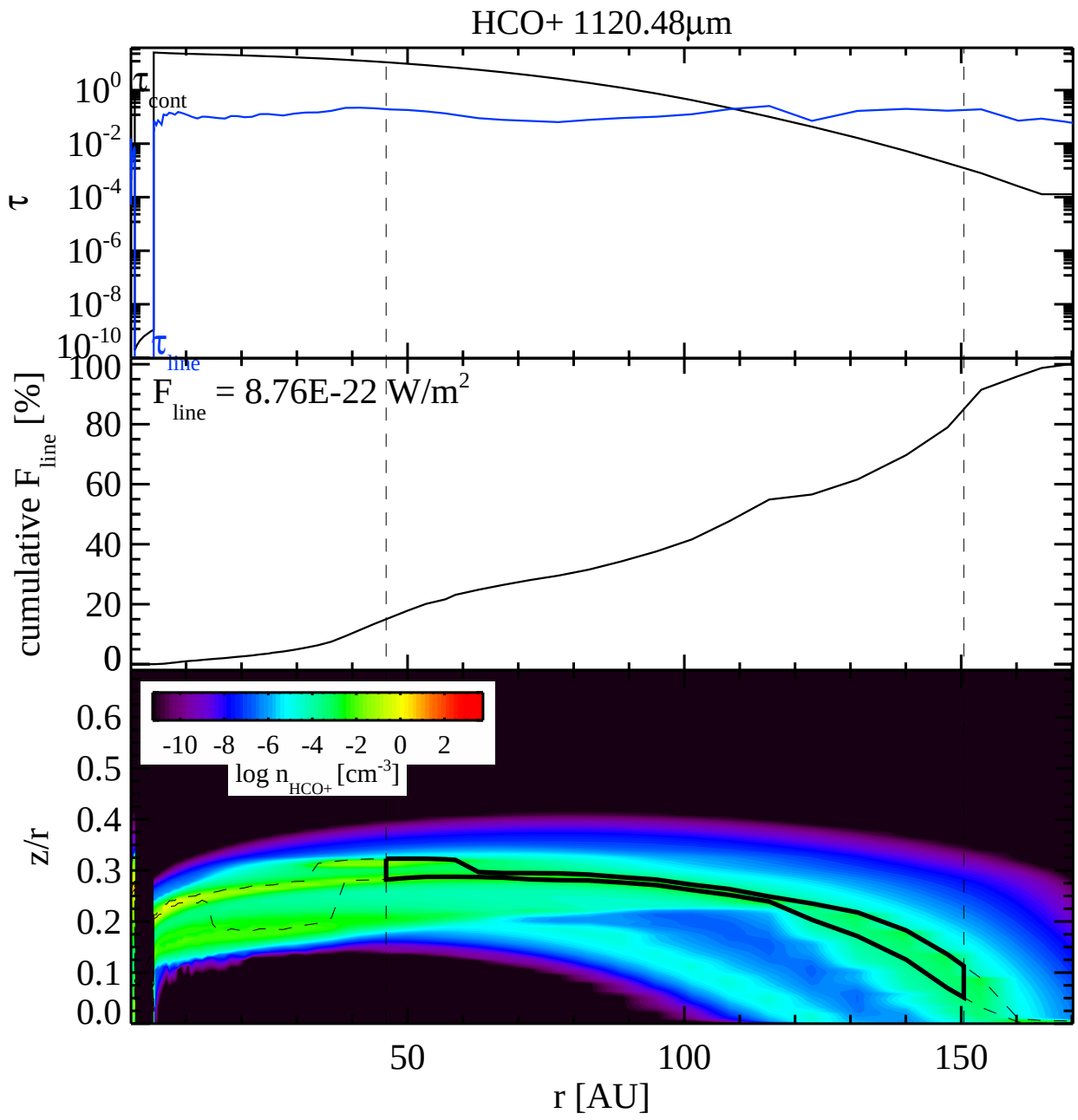

CN 1321.39µm
τ
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 6.06E-22 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6
log n_{CN} [cm^{-3}]
50
100
150
r [AU]

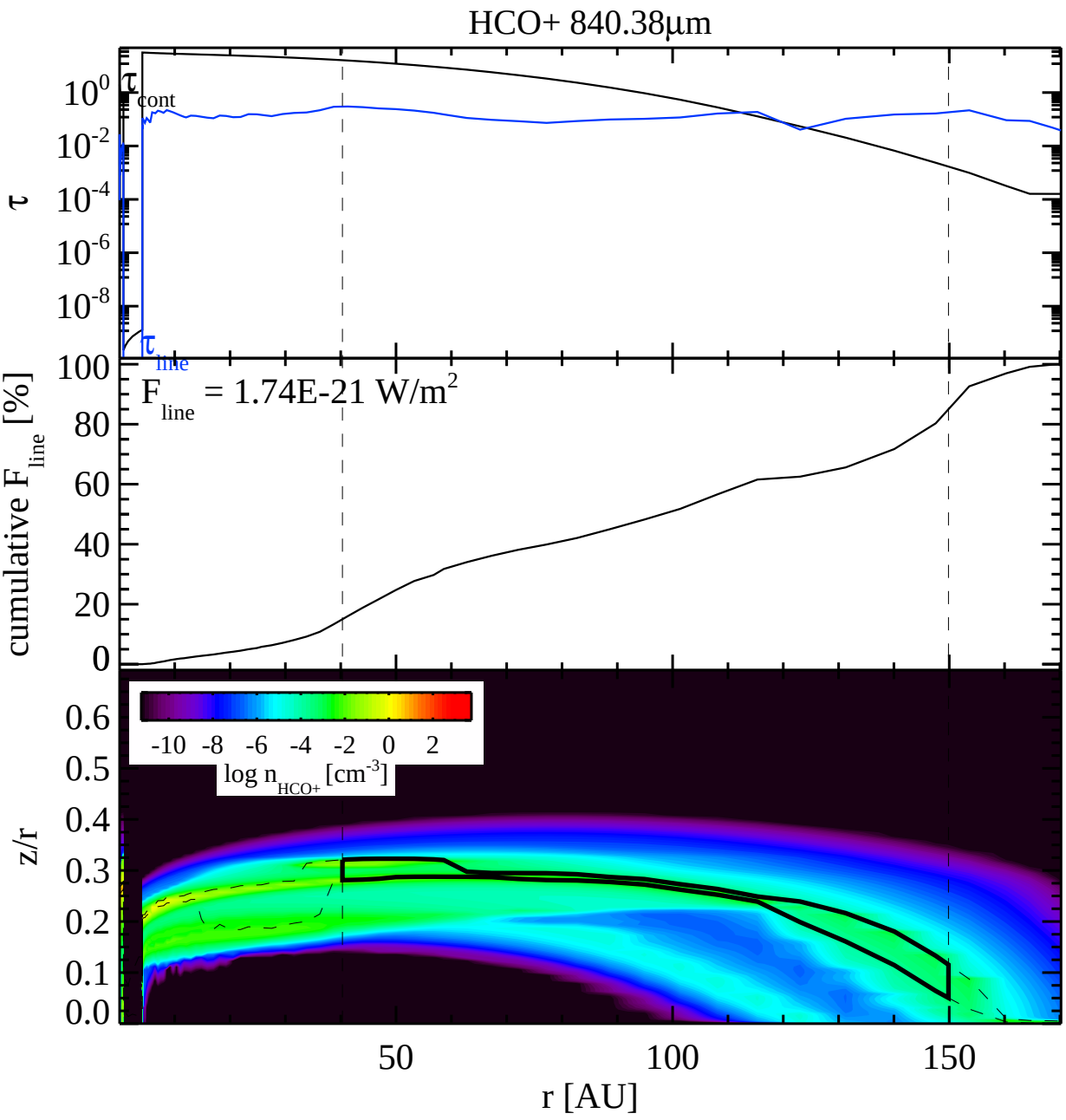

CN 528.78µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
10^-8
cumulative F line [%]
F line = 3.18E-21 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6
log n CN [cm^-3]
50
100
150
r [AU]

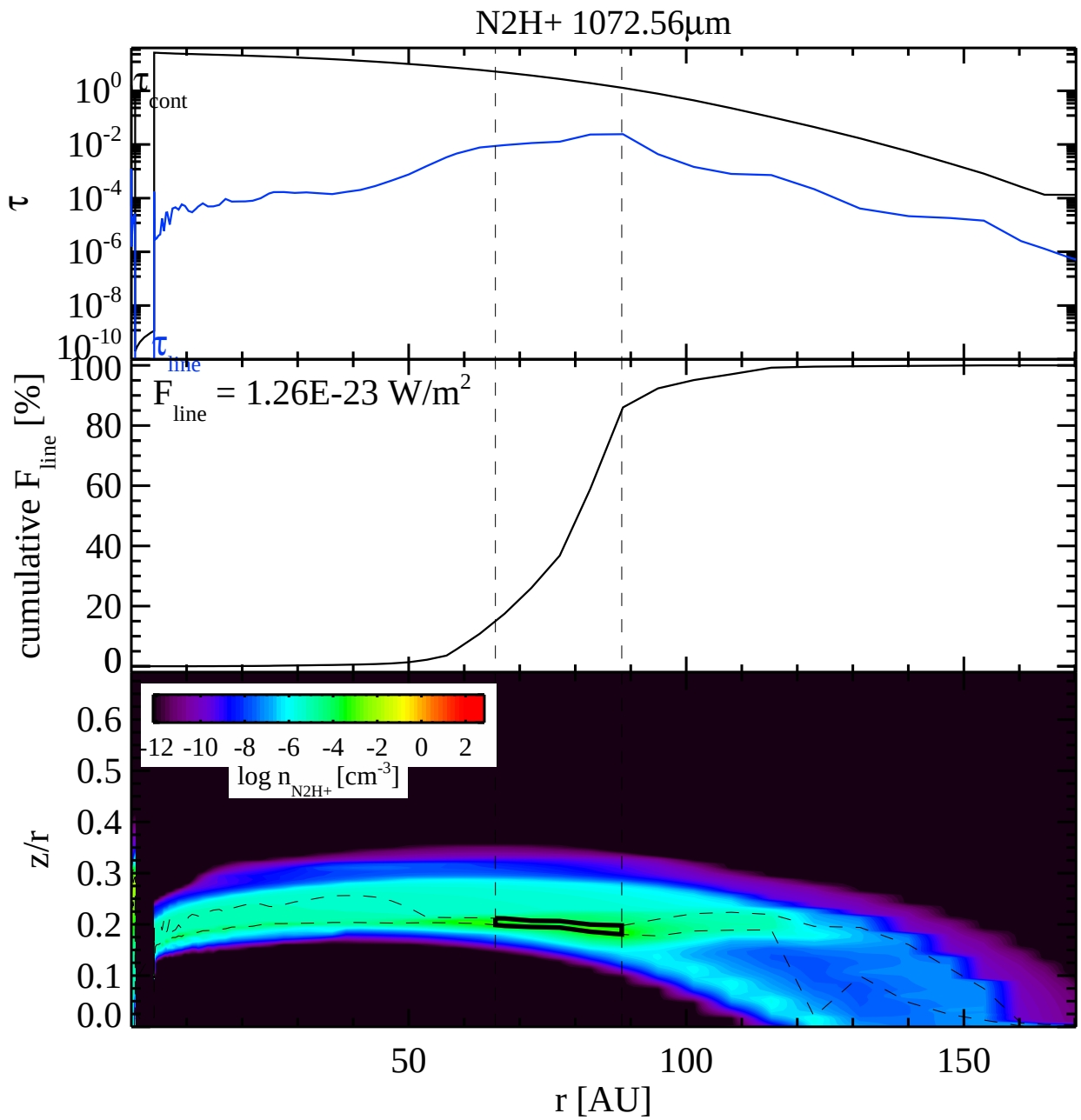

HCN 1127.52µm
τ
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
F_{line} = 1.42E-20 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-6 -4 -2 0 2 4 6 8
log n_{HCN} [cm^{-3}]
50
100
150
r [AU]

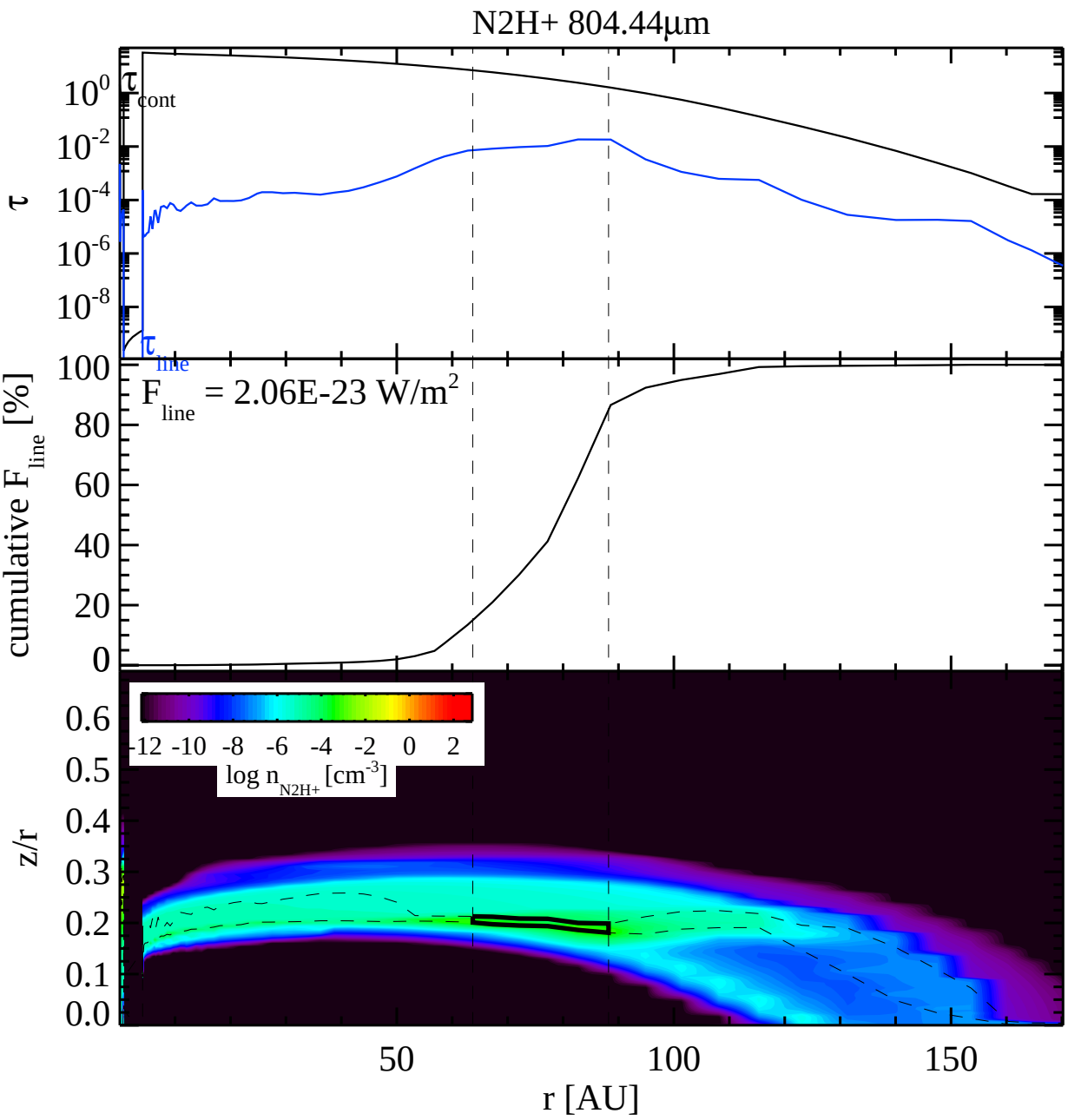

HCN 845.66µm
τ
τ cont
τ line
cumulative F line [%]
F line = 3.03E-20 W/m2
log n HCN [cm-3]
z/r
r [AU]

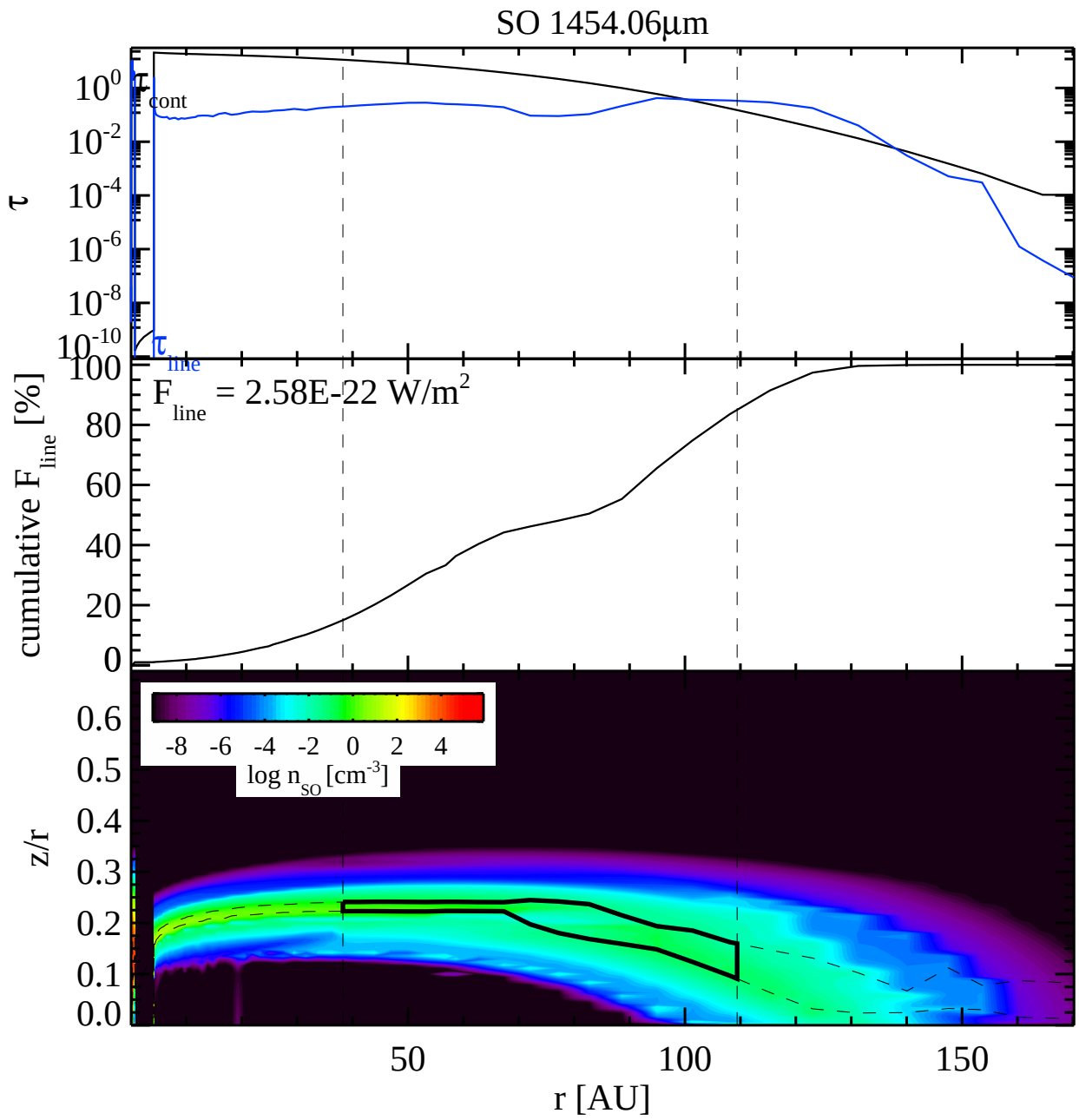

HCO+ 3361.33µm
τ
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
τ cont
τ line
F line = 9.54E-24 W/m^2
cumulative F line [%]
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-10 -8 -6 -4 -2 0 2
log n HCO+ [cm^-3]
50
100
150
r [AU]

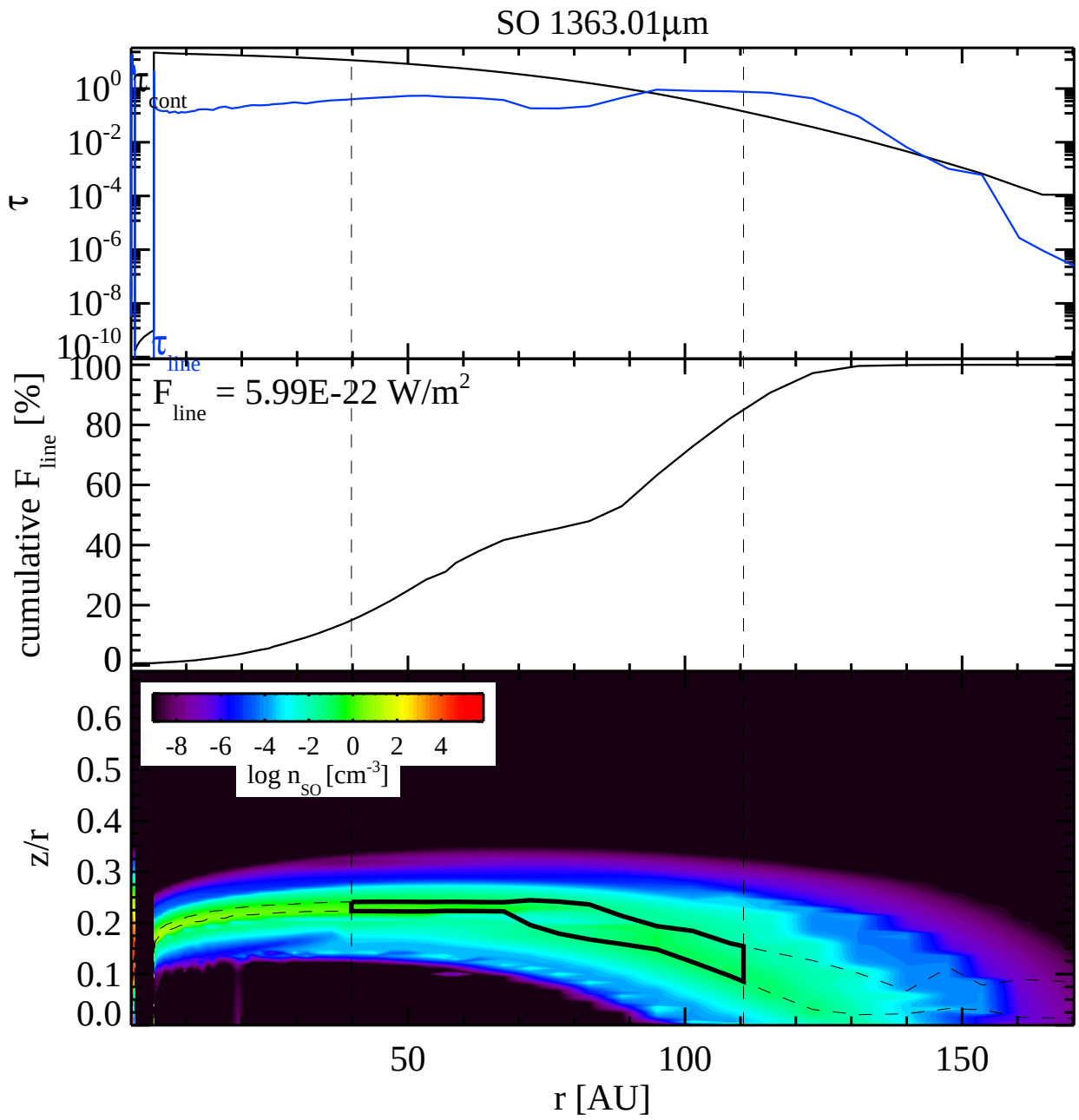

HCO+ 1120.48µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
cumulative F line [%]
F line = 8.76E-22 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-10 -8 -6 -4 -2 0 2
log n HCO+ [cm^-3]
50
100
150
r [AU]

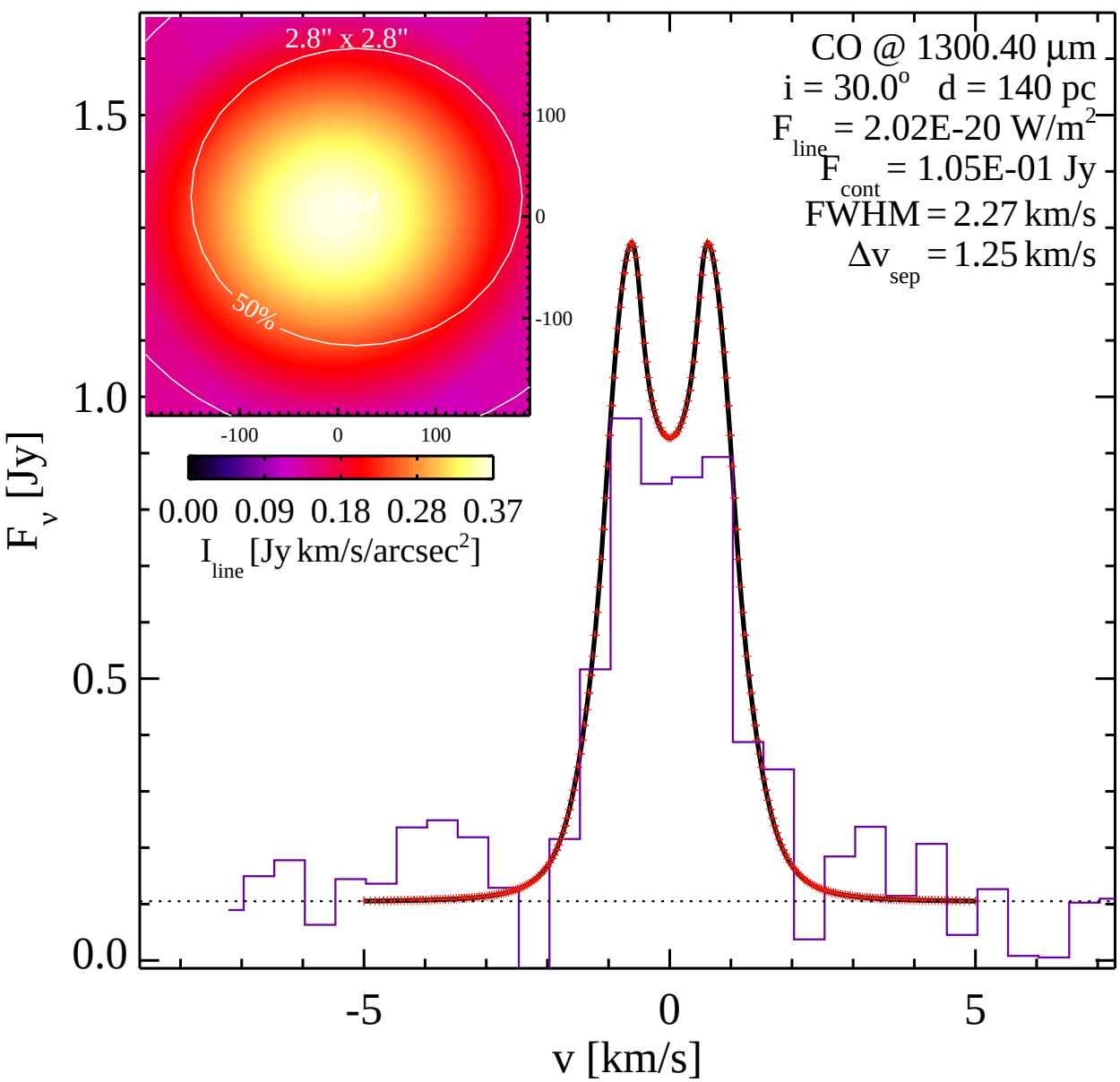

HCO+ 840.38µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
10^-8
cumulative F line [%]
F line = 1.74E-21 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-10 -8 -6 -4 -2 0 2
log n HCO+ [cm^-3]
50
100
150
r [AU]

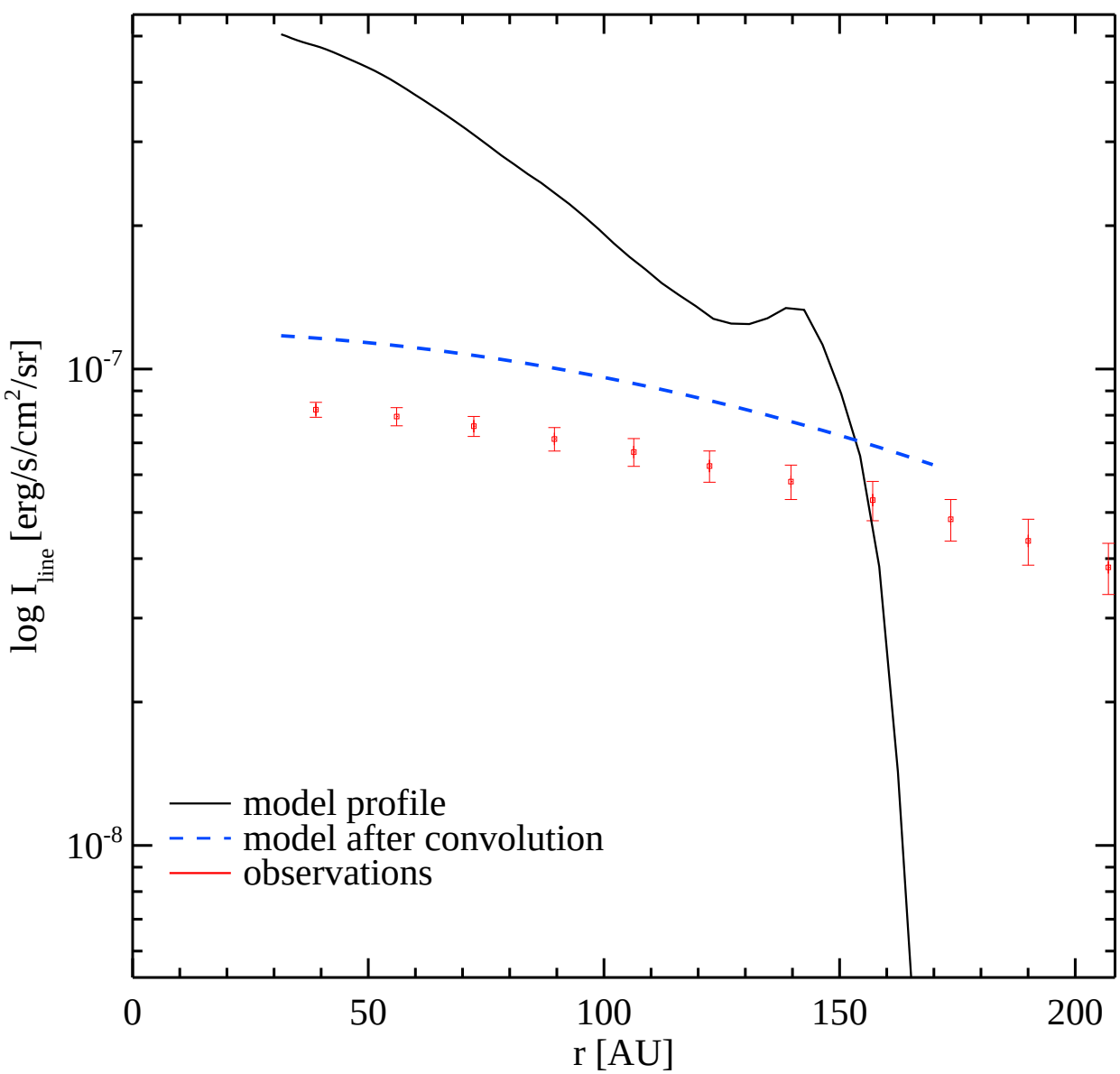

N2H+ 1072.56µm
τ
τ cont
τ line
cumulative F line [%]
F line = 1.26E-23 W/m2
log n N2H+ [cm-3]
z/r
r [AU]

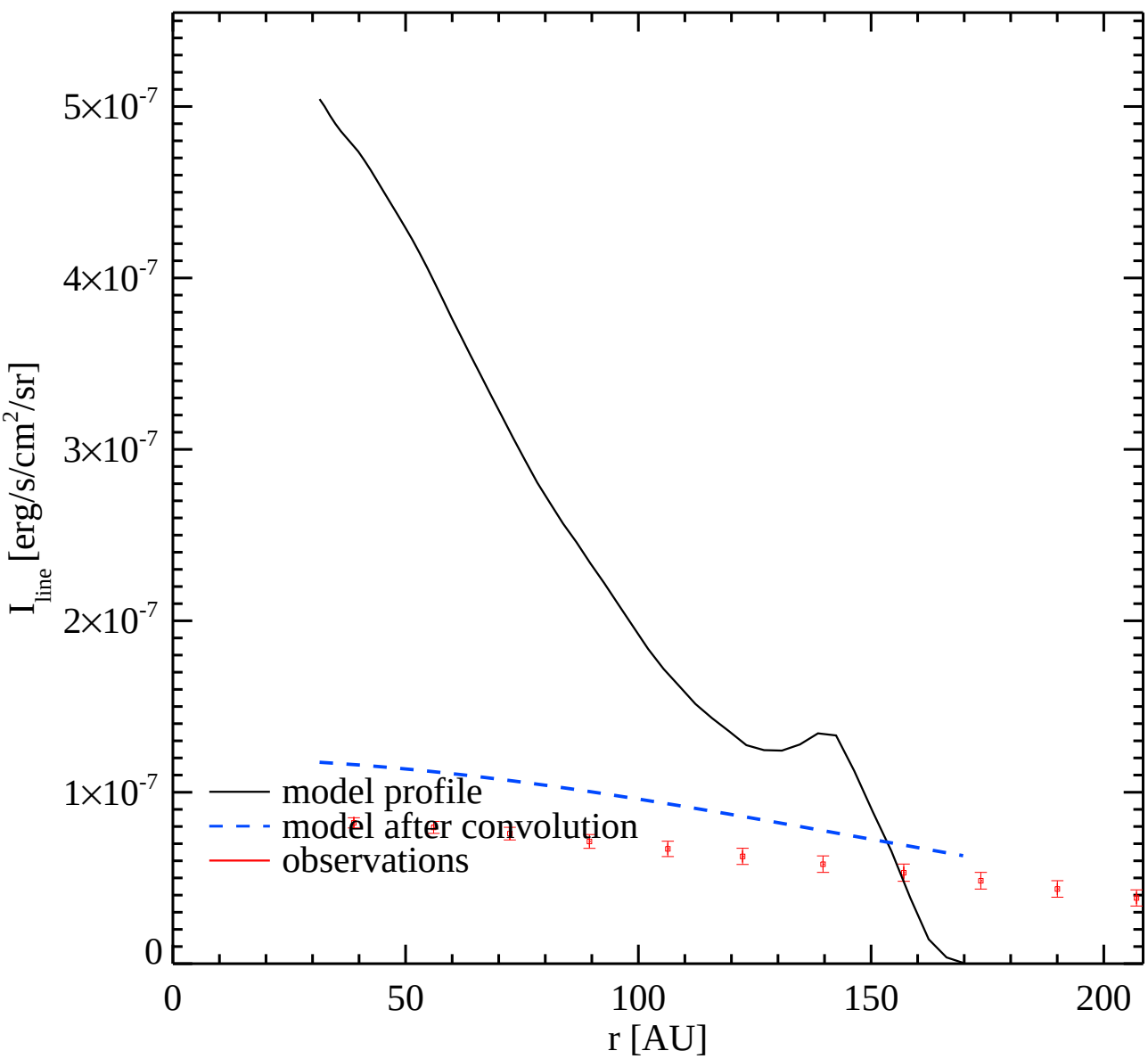

N2H+ 804.44µm
τ
τ cont
τ line
10^0
10^-2
10^-4
10^-6
10^-8
cumulative F line [%]
F line = 2.06E-23 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-12 -10 -8 -6 -4 -2 0 2
log n N2H+ [cm^-3]
50
100
150
r [AU]

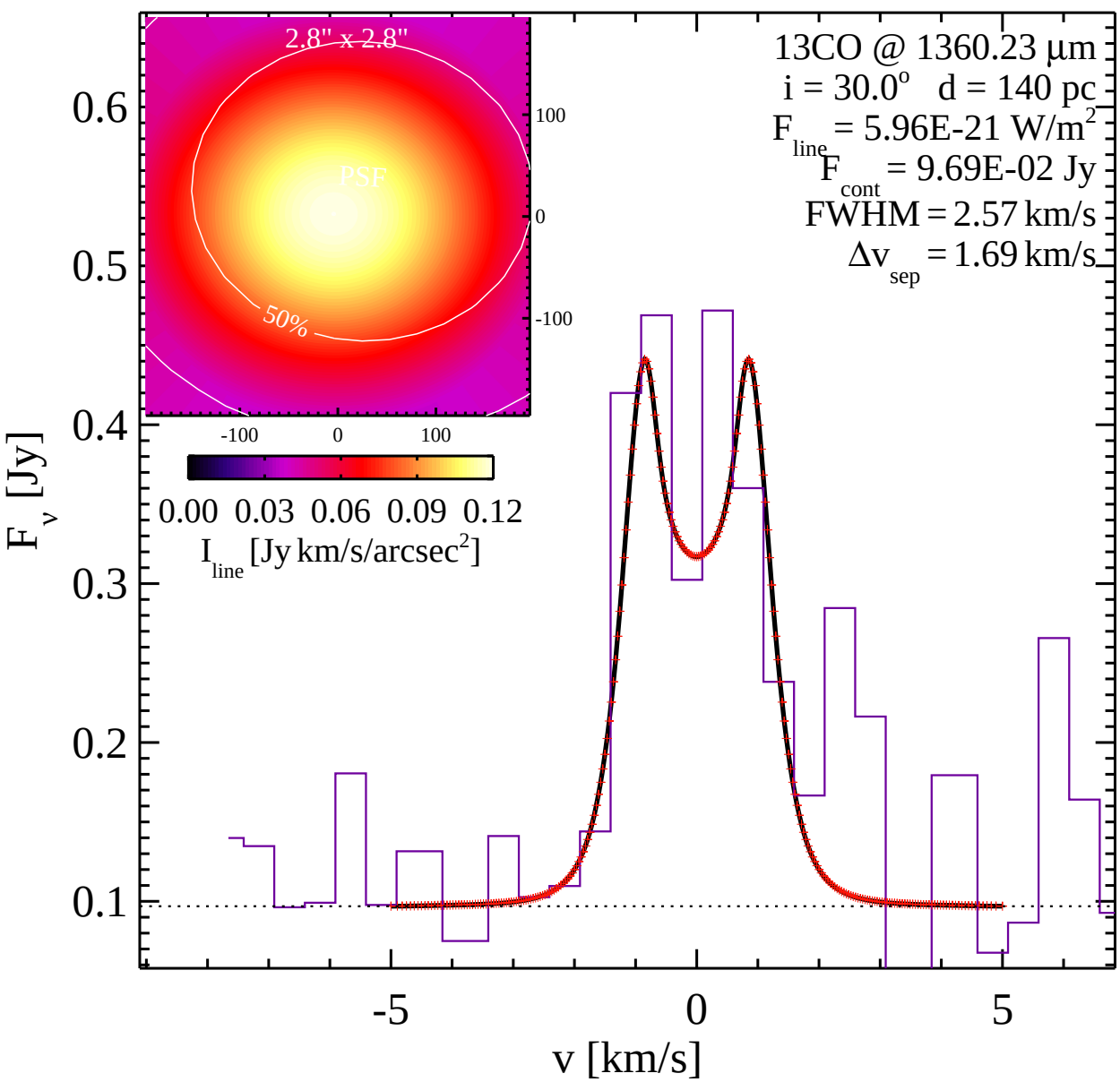

SO 1454.06µm
τ
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
τ cont
τ line
cumulative F line [%]
F line = 2.58E-22 W/m^2
100
80
60
40
20
0
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4
log n SO [cm^-3]
50
100
150
r [AU]

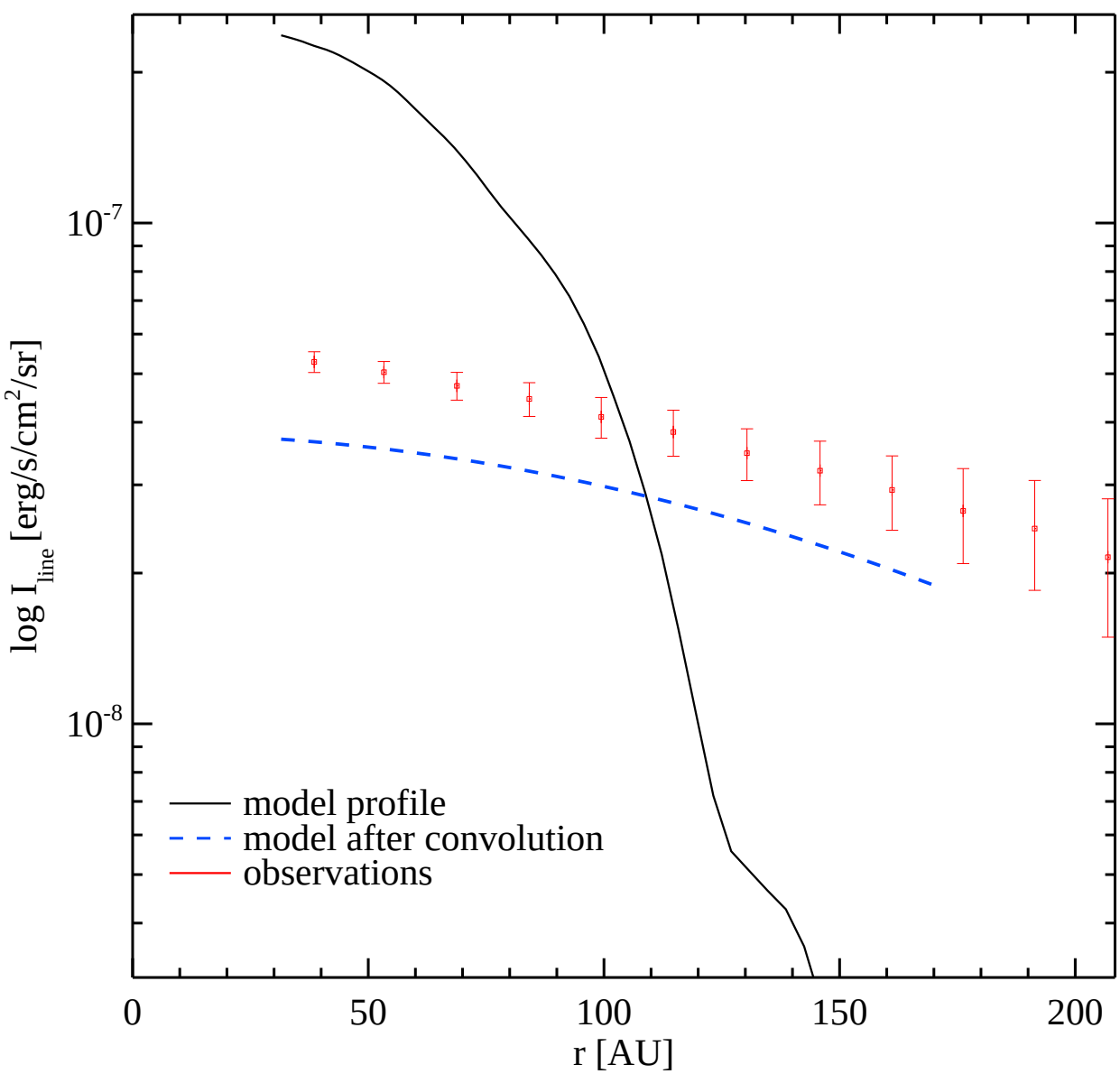

SO 1363.01µm
τ
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
τ_{cont}
τ_{line}
cumulative F_{line} [%]
100
80
60
40
20
0
F_{line} = 5.99E-22 W/m^2
z/r
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-8 -6 -4 -2 0 2 4
log n_{SO} [cm^{-3}]
50
100
150
r [AU]

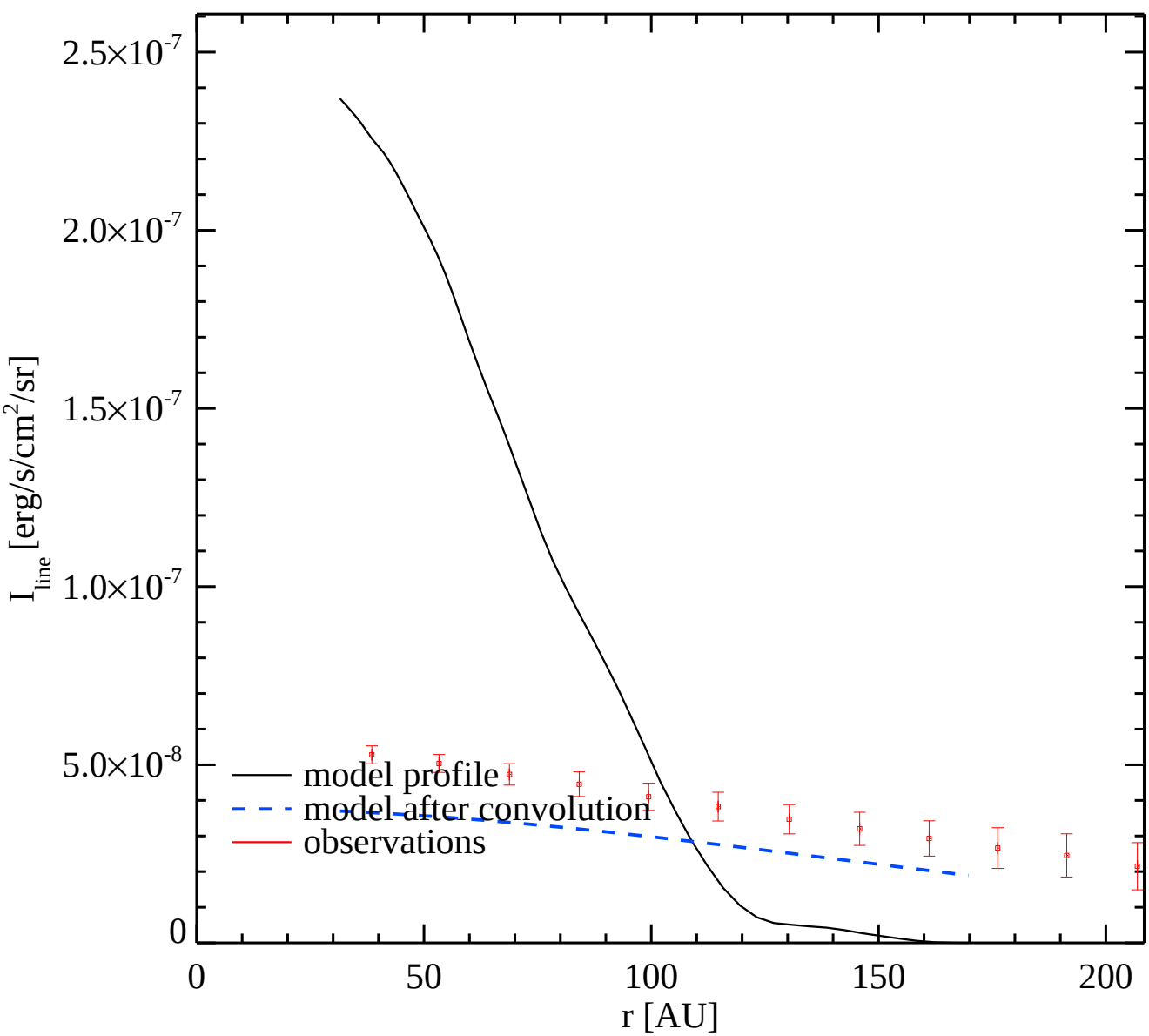

CO @ 1300.40 µm
i = 30.0° d = 140 pc
F line = 2.02E-20 W/m2
F cont = 1.05E-01 Jy
FWHM = 2.27 km/s
Δv sep = 1.25 km/s
2.8" x 2.8"
50%
PSF
100
0
-100
-100 0 100
0.00 0.09 0.18 0.28 0.37
I line [Jy km/s/arcsec2]
F v [Jy]
1.5
1.0
0.5
0.0
-5 0 5
v [km/s]

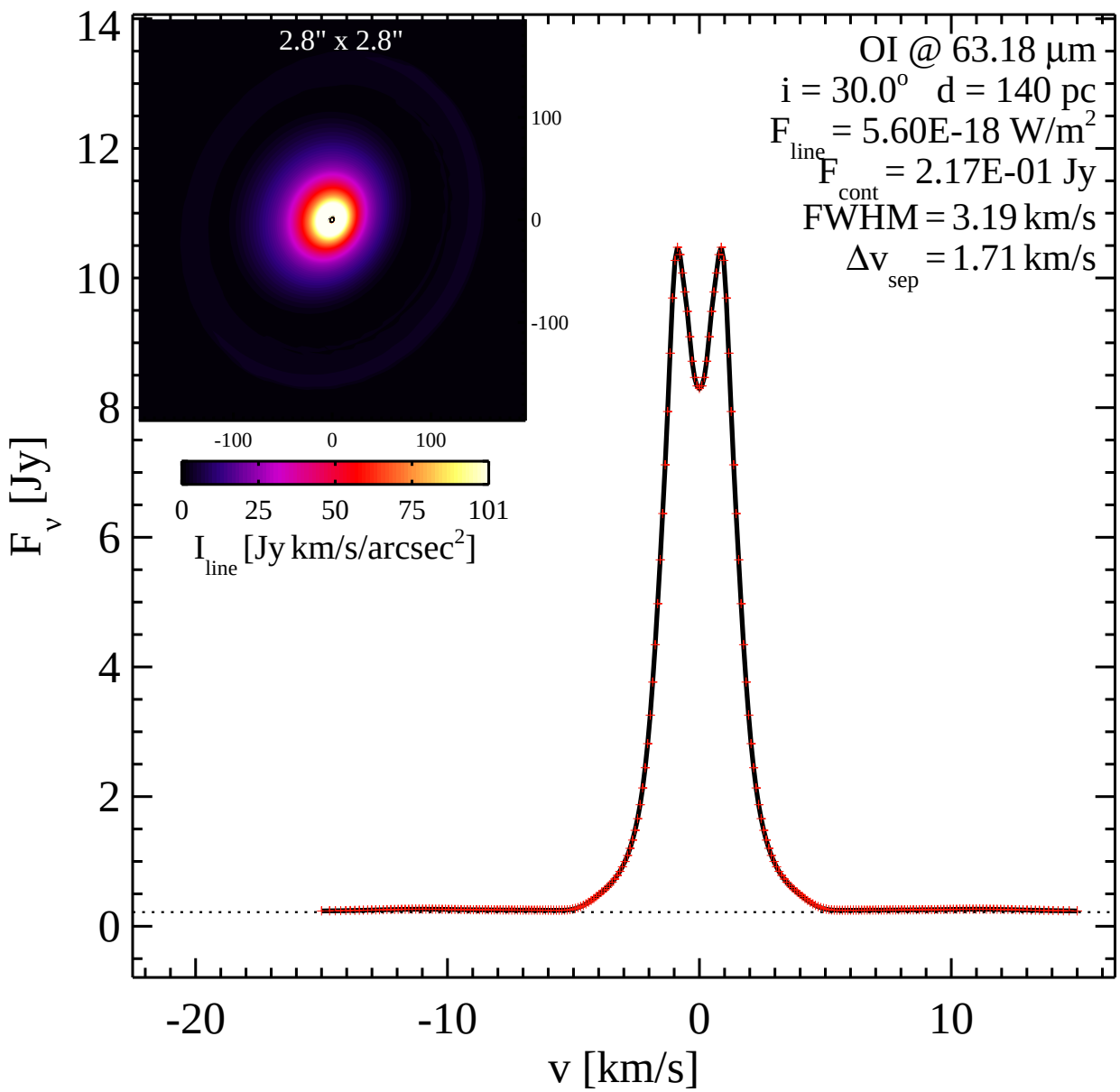

log I_line [erg/s/cm^2/sr]
10^-7
10^-8
0
50
100
150
200
r [AU]
model profile
model after convolution
observations

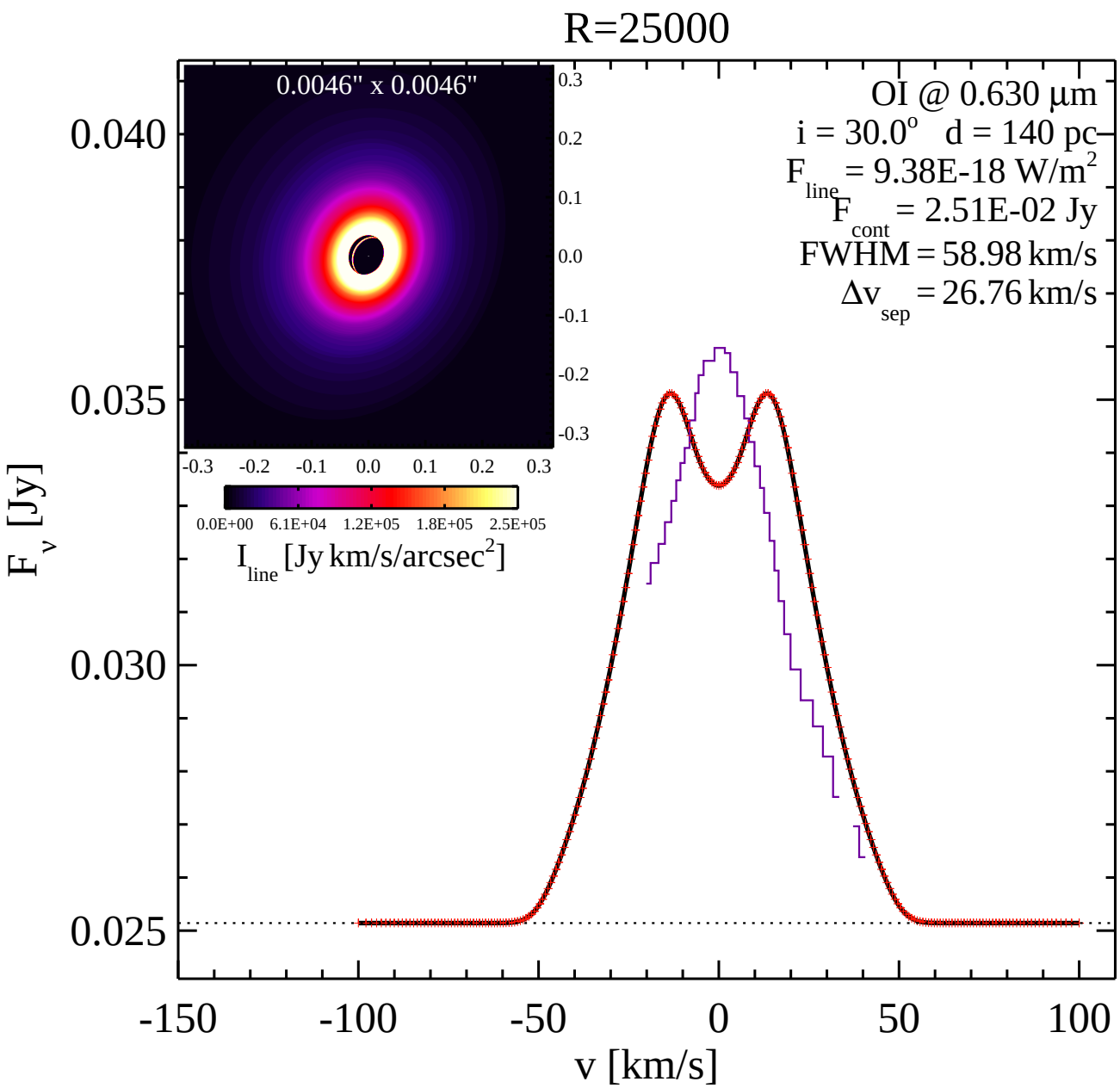

5×10-7
4×10-7
3×10-7
2×10-7
1×10-7
0
Iline [erg/s/cm2/sr]
0
50
100
150
200
r [AU]
model profile
model after convolution
observations

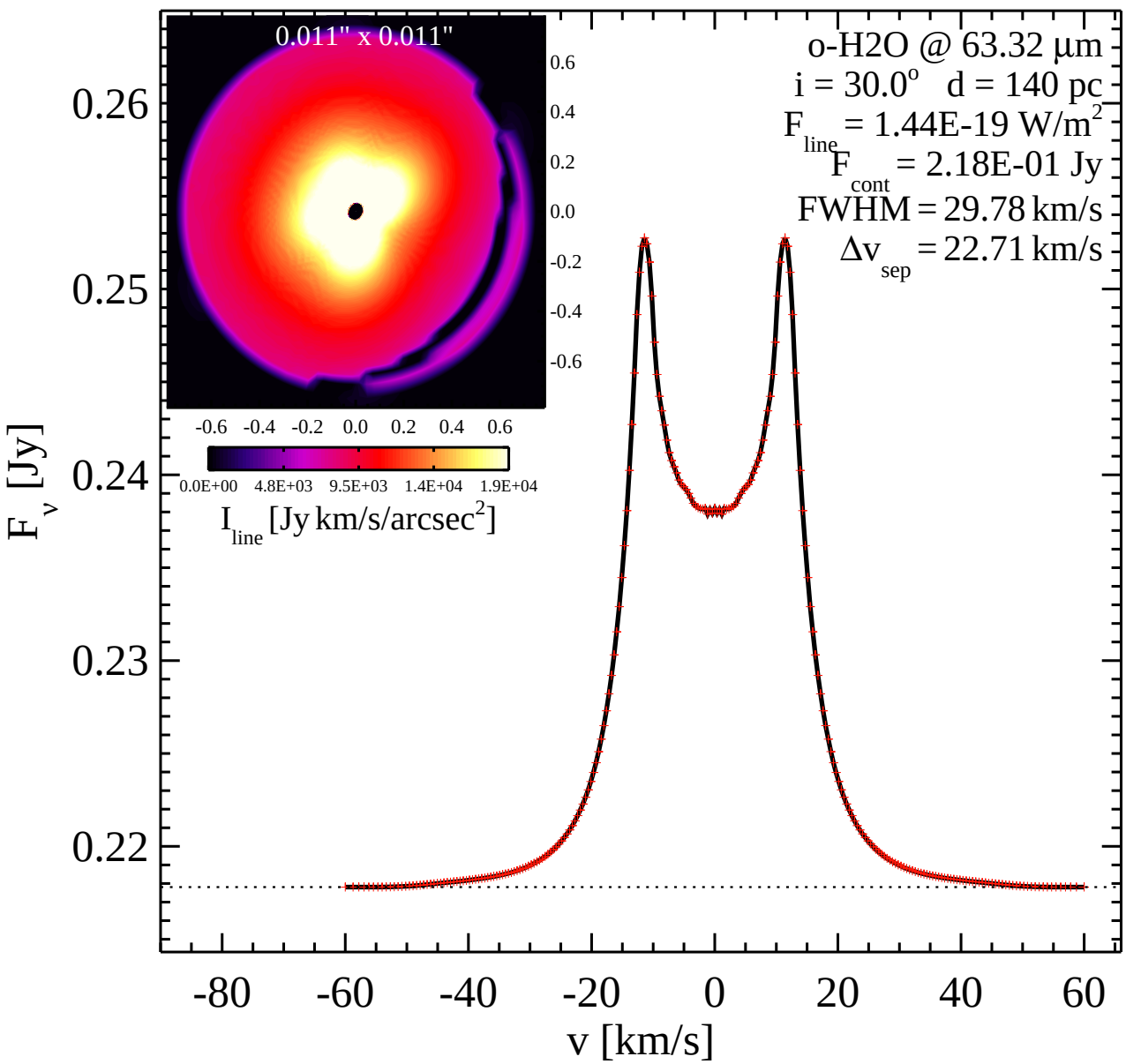

13CO @ 1360.23 µm
i = 30.0° d = 140 pc
F line = 5.96E-21 W/m2
F cont = 9.69E-02 Jy
FWHM = 2.57 km/s
Δv sep = 1.69 km/s
2.8" x 2.8"
PSF
50%
100
0
-100
-100 0 100
0.00 0.03 0.06 0.09 0.12
I line [Jy km/s/arcsec2]
F v [Jy]
0.6
0.5
0.4
0.3
0.2
0.1
-5 0 5
v [km/s]

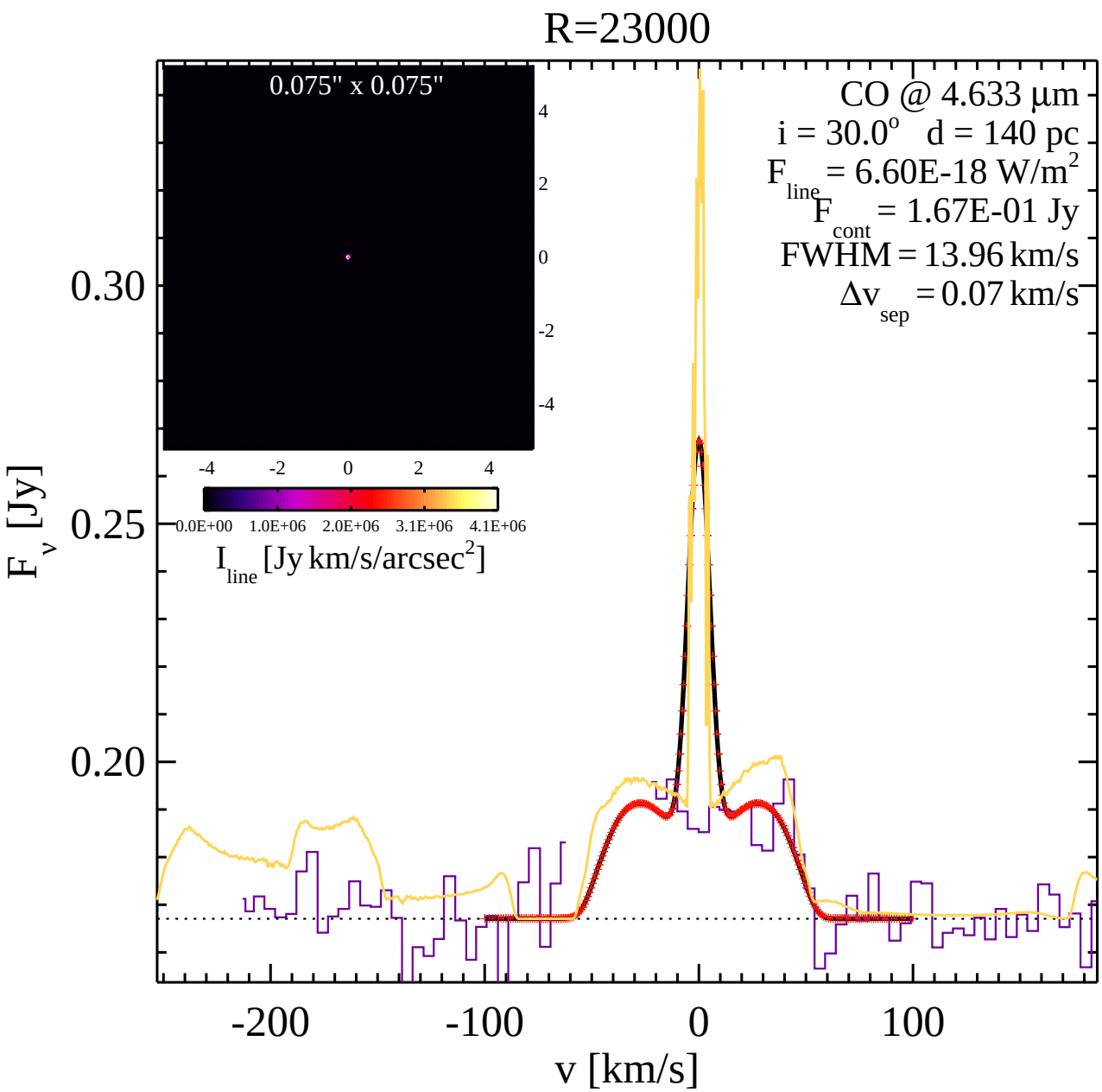

log I_line [erg/s/cm^2/sr]
10^-7
10^-8
0
50
100
150
200
r [AU]
model profile
model after convolution
observations

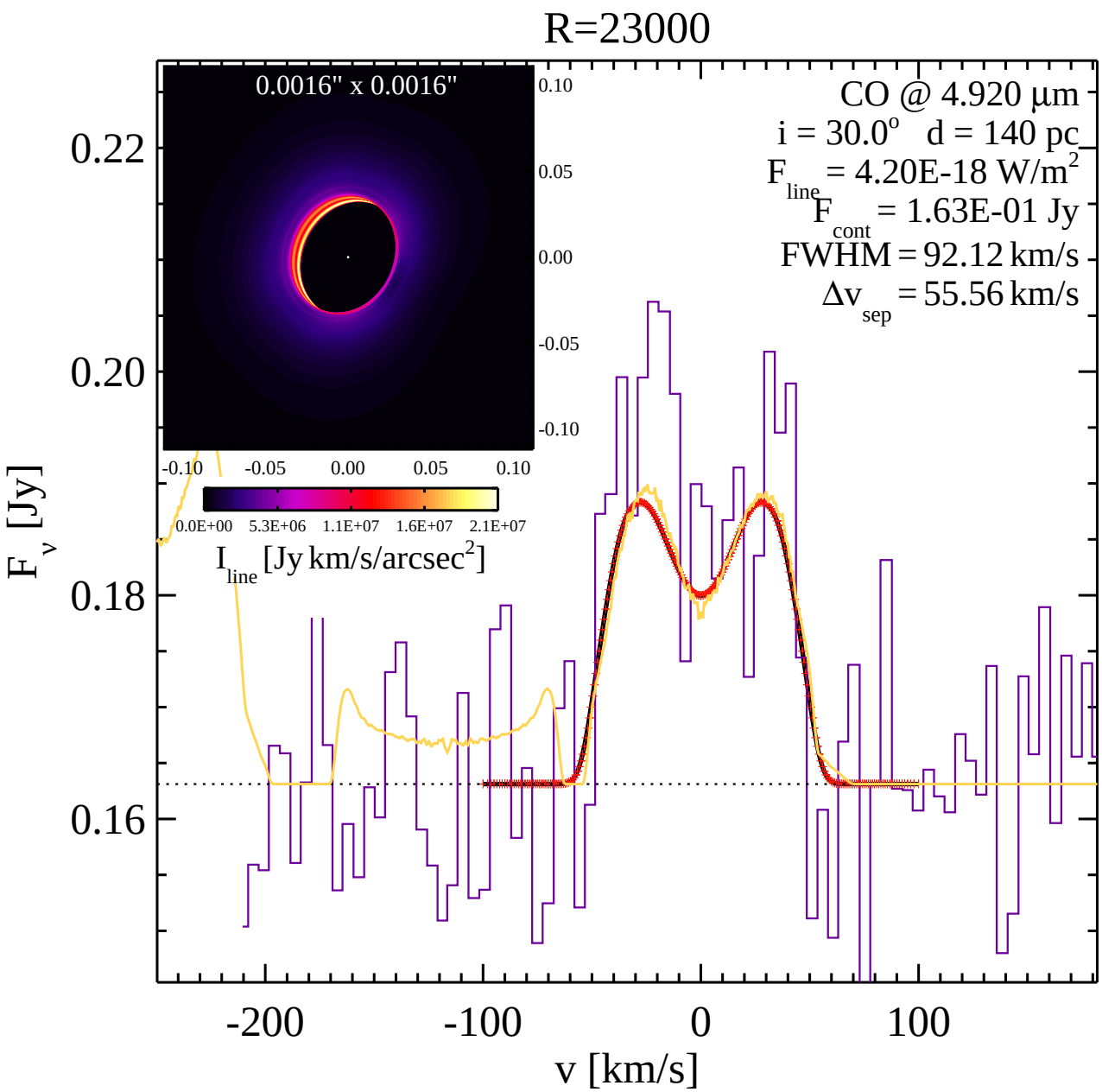

2.5×10-7
2.0×10-7
1.5×10-7
1.0×10-7
5.0×10-8
0
I line [erg/s/cm2/sr]
0
50
100
150
200
r [AU]
model profile
model after convolution
observations


2.8" x 2.8"
100
0
-100
-100
0
100
0
25
50
75
101
I line [Jy km/s/arcsec2]
OI @ 63.18 µm
i = 30.0o d = 140 pc
F line = 5.60E-18 W/m2
F cont = 2.17E-01 Jy
FWHM = 3.19 km/s
Δv sep = 1.71 km/s
F v [Jy]
v [km/s]
14
12
10
8
6
4
2
0
-20
-10
0
10


R=25000
0.0046" x 0.0046"
OI @ 0.630 µm
i = 30.0° d = 140 pc
F line = 9.38E-18 W/m2
F cont = 2.51E-02 Jy
FWHM = 58.98 km/s
Δv sep = 26.76 km/s
0.040
0.035
0.030
0.025
F v [Jy]
-150
-100
-50
0
50
100
v [km/s]
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.3 -0.2 -0.1 0.0 0.1 0.2 0.3
0.0E+00 6.1E+04 1.2E+05 1.8E+05 2.5E+05
I line [Jy km/s/arcsec2]


o-H2O @ 63.32 µm
i = 30.0° d = 140 pc
F line = 1.44E-19 W/m2
F cont = 2.18E-01 Jy
FWHM = 29.78 km/s
Δv sep = 22.71 km/s
0.011" x 0.011"
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6
0.0E+00 4.8E+03 9.5E+03 1.4E+04 1.9E+04
I line [Jy km/s/arcsec2]
F v [Jy]
0.26
0.25
0.24
0.23
0.22
-80 -60 -40 -20 0 20 40 60
v [km/s]


R=23000
0.075" x 0.075"
4
2
0
-2
-4
-4
-2
0
2
4
0.0E+00
1.0E+06
2.0E+06
3.1E+06
4.1E+06
I line [Jy km/s/arcsec2]
CO @ 4.633 µm
i = 30.0o d = 140 pc
F line = 6.60E-18 W/m2
F cont = 1.67E-01 Jy
FWHM = 13.96 km/s
Δv sep = 0.07 km/s
0.30
0.25
0.20
F v [Jy]
-200
-100
0
100
v [km/s]


R=23000
0.0016" x 0.0016"
0.10
0.05
0.00
-0.05
-0.10
-0.10
-0.05
0.00
0.05
0.10
0.0E+00
5.3E+06
1.1E+07
1.6E+07
2.1E+07
I line [Jy km/s/arcsec2]
CO @ 4.920 µm
i = 30.0o d = 140 pc
F line = 4.20E-18 W/m2
F cont = 1.63E-01 Jy
FWHM = 92.12 km/s
Δv sep = 55.56 km/s
0.22
0.20
0.18
0.16
F v [Jy]
-200
-100
0
100
v [km/s]