PDR-Model Comparison

Lorentz Center Leiden

Benchmark Problem Results
Version 3 - End of 2. Iteration

M.Röllig

Participating Models

Model Name	*Authors*
Aikawa	*H.-H. Lee, E. Herbst, G. Pineau des Forets, J. Le Bourlot, Y. Aikawa, N. Kuboi*
Bensch	*H. Störzer, B. Köster, M. Zilinsky, U. Leuenhagen, S.Jeyakumar, F. Bensch*
CLOUDY	*Gary J. Ferland, Peter van Hoof, Nick P. Abel, Gargi Shaw*
COSTAR	*I. Kamp, F. Bertoldi, G.-J. van Zadelhoff*
HTBKW	*D. Hollenbach, A.G.G.M. Tielens, M.G. Burton, M.J. Kaufman, M.G. Wolfire*
KOSMA	*H. Störzer, B. Köster, M. Zilinsky, U. Leuenhagen, S.Jeyakumar, M.Röllig*
Lee96mod	*H.-H. Lee, E. Herbst, G. Pineau des Forets, E. Roueff, J. Le Bourlot*
Leiden	*J. Black, E. van Dishoeck, D. Jansen and B. Jonkheid*
Meijerink	*R.Meijerink, M.Spaans*
Meudon	*J. Le Bourlot, E. Roueff, F. Le Petit*
Sternberg	*A.Sternberg, A.Dalgarno*
UCL_PDR	*S. Viti, Wing-Fai Thi, Tom Bell*

Changes in Version 3

- New results plotted for:
  - Bensch
  - CLOUDY
  - HTBKW
  - KOSMA-tau
  - Meijerink
  - Meudon
  - UCL_PDR
- KOSMA changed name to KOSMA-tau (tau: Tel Aviv University)
- New plots have white background, former plots have colored background

Benchmark Calculations

- standard chemistry:

  31 species

  H, H^+, H_2, H_2^+, H_3^+, O, O^+, OH^+, OH, O_2, O_2^+, H_2O, H_2O^+, H_3O^+, C, C^+, CH, CH^+, CH_2, CH_2^+, CH_3, CH_3^+, CH_4, CH_4^+, CH_5^+, CO, CO^+, HCO^+, He, He^+, e^-

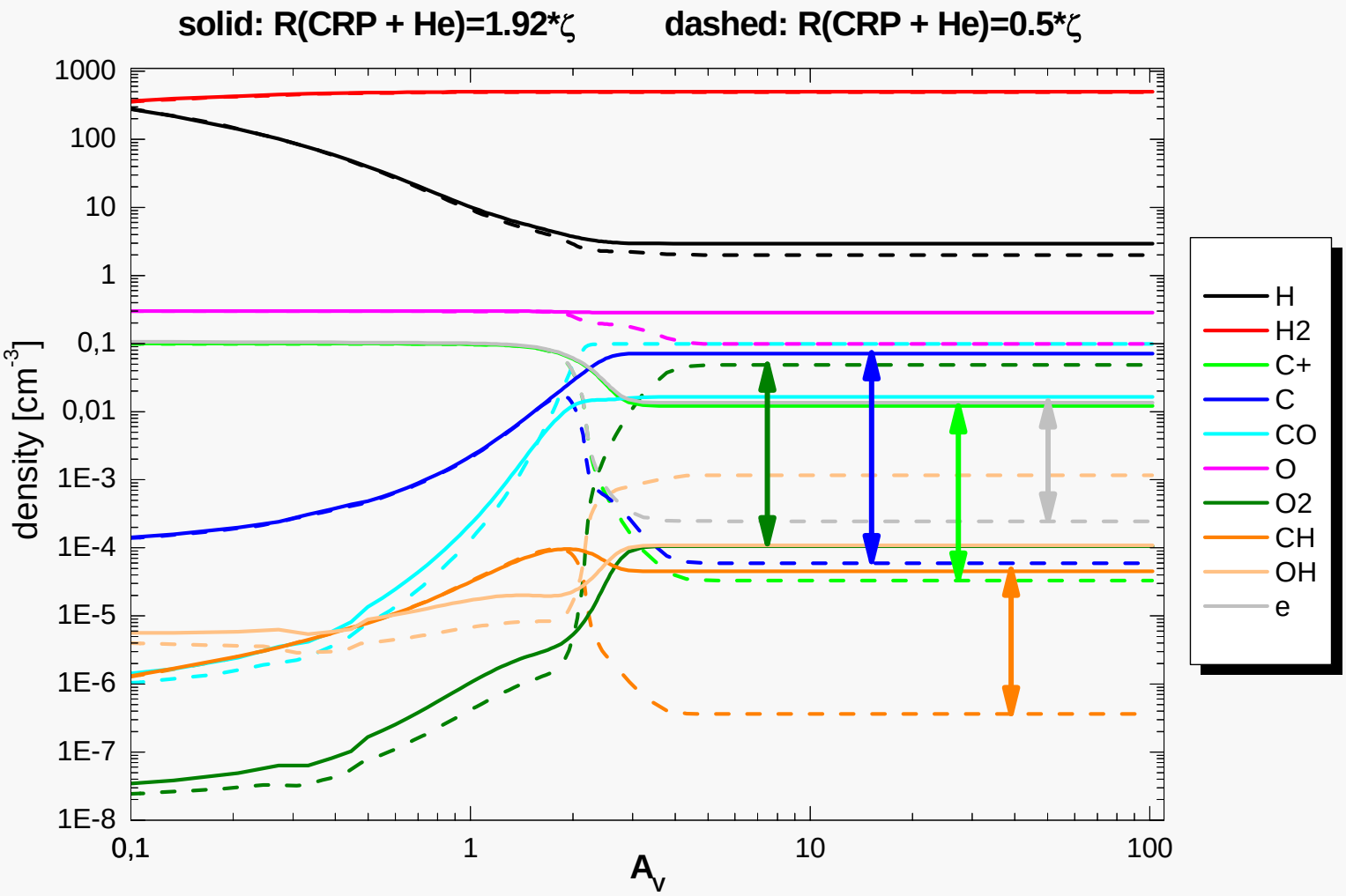
  elemental abundances

  $He=0.1$, $C=1.0\times10^{-4}$, $O=3.0\times10^{-4}$

  standardized chemical network

  PAH's switched off

Influence of one single CRP rate



Benchmark Calculations

- standard radiation field

  normalized to Draine field(1978)

  cosmic-ray ionization: $\zeta = 5 \times 10^{-17}\ s^{-1}$

  visual extinction: $A_V = 6.289 \times 10^{-22} \times N_{Htotal}$

  dust attenuation: $\tau_{UV} = 3.02 \times A_V$

Benchmark Calculations

Requested Quantities

For the species: H, H_2, C^+, C, CO, O, O_2, CH, OH, e^-

1. local absolute volume densities (cm^{-3}) vs. depth
2. column densities (cm^{-2}) vs. depth

3. dissociation/ionization rates (s^{-1}) vs. depth for H_2, C, CO
4. local cooling/heating rates (erg s^{-1} cm^{-3})
   fine structure lines of CII(158m), OI(63µ,146µ), and CI(610µ,370µ), and photoelectric grain heating
5. gas and dust temperature for models F5-F8

Benchmark Calculations

F1 completed by all 12 groups

F2-F4 complete by 10 groups

F5-F8 completed by 8 groups (some with numerical ‘noise’)

CLOUDY uses different chemical network

KOSMA/Bensch use spherical geometry

results for Lee96mod are for t=10^8 yrs

F1 T=const $n=10^3\ cm^{-3}$, $\chi=10$	**F2** T=const $n=10^3\ cm^{-3}$, $\chi=10^5$
F3 T=const $n=10^{5.5}\ cm^{-3}$, $\chi=10$	**F4** T=const $n=10^{5.5} cm^{-3}$, $\chi=10^5$
F5 T=variable $n=10^3\ cm^{-3}$, $\chi=10$	**F6** T=variable $n=10^3\ cm^{-3}$, $\chi=10^5$
F7 T=variable $n=10^{5.5}\ cm^{-3}$, $\chi=10$	**F8** T=variable $n=10^{5.5} cm^{-3}$, $\chi=10^5$

Preliminary Results

overview plots of the benchmark runs will be available online as PDF files:

http://www.ph1.uni-koeln.de/~roellig/

Model Results F1-F8

- photoreaction rates
- densities
- heating/cooling rates
- surface brightnesses

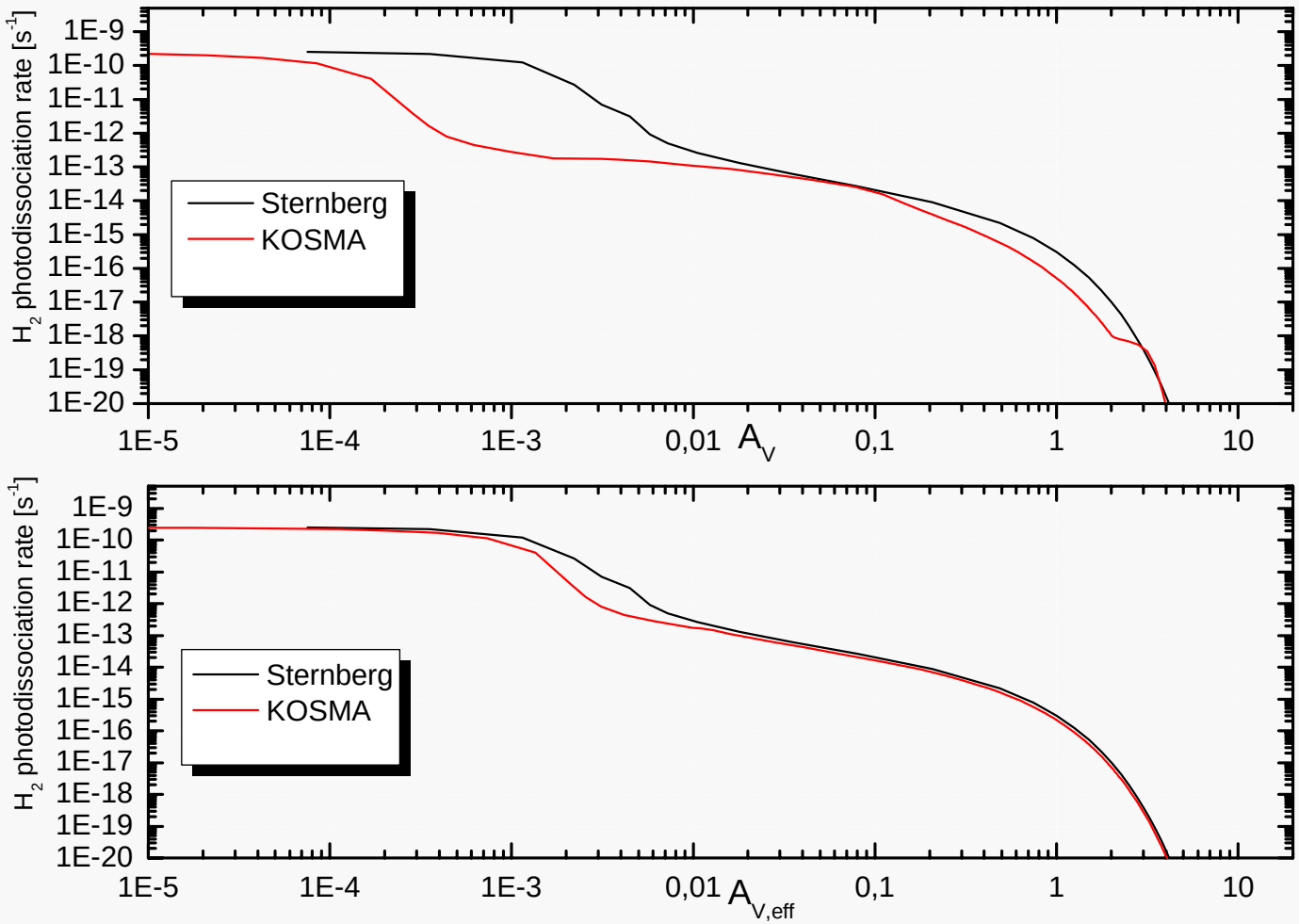
Model Results F1-F8

- photoreaction rates
- densities
- heating/cooling rates
- surface brightnesses

Modell	z	AV	H2	CO	CI	H2/Sternb	CO/Sternb	CI/Sternb
Aikawa	0,00E+00	0	*2,59E-10*	*1,00E-09*	*3,00E-10*	1,01E+00	1,00E+00	2,00E-01
Bensch	0,00E+00	0	*2,47E-10*	*1,00E-09*	*1,50E-09*	9,63E-01	1,00E+00	1,00E+00
CLOUDY	1,08E+12	6,82E-07	*2,32E-10*	*1,01E-09*	*1,70E-09*	9,02E-01	1,01E+00	1,13E+00
COSTAR	0,00E+00	0	*2,59E-10*	*3,00E-10*	*1,50E-09*	1,01E+00	3,00E-01	1,00E+00
HTBKW	4,77E+10	3,00E-08	*2,60E-10*	*1,00E-09*	*1,50E-09*	1,01E+00	1,00E+00	1,00E+00
KOSMA	0,00E+00	0,00E+00	*2,48E-10*	*9,19E-10*	*1,50E-09*	9,63E-01	9,19E-01	1,00E+00
Lee96mod	5,00E+14	3,15E-04	*2,48E-10*	*9,98E-10*	*3,00E-10*	9,67E-01	9,98E-01	2,00E-01
Leiden	9,21E+13	8,24E-05	*2,51E-10*	*8,85E-10*	*1,66E-09*	9,77E-01	8,85E-01	1,11E+00
Meijerink	0,00E+00	0,00E+00	*2,59E-10*	*1,00E-09*	*1,50E-09*	1,01E+00	1,00E+00	1,00E+00
Meudon	7,95E+10	5,00E-08	*3,08E-10*	*1,01E-09*	*1,72E-09*	1,20E+00	1,01E+00	1,14E+00
Sternberg	0,00E+00	0,00E+00	*2,57E-10*	*1,00E-09*	*1,50E-09*	1,00E+00	1,00E+00	1,00E+00
UCL_PDR	1,70E+12	1,07E-06	*2,59E-10*	*1,00E-09*	*1,50E-09*	1,01E+00	1,00E+00	1,00E+00

Modell	z	AV	H2	CO	CI	H2/Sternb	CO/Sternb	CI/Sternb
Aikawa	5,00E+16	3,20E-02	*1,33E-13*	*6,80E-10*	*2,74E-10*	1,89E+00	7,49E-01	2,04E-01
Bensch	5,86E+16	1,17E-01	*1,47E-14*	*6,73E-10*	*1,07E-09*	2,09E-01	7,41E-01	7,96E-01
CLOUDY	4,83E+16	3,04E-02	*8,57E-14*	*9,38E-10*	*1,55E-09*	1,22E+00	1,03E+00	1,16E+00
COSTAR	5,08E+16	3,19E-02	*8,52E-14*	*2,35E-10*	*1,36E-09*	1,21E+00	2,59E-01	1,02E+00
HTBKW	4,69E+16	2,95E-02	*1,81E-13*	*7,55E-10*	*1,37E-09*	2,57E+00	8,31E-01	1,02E+00
KOSMA	5,06E+16	1,05E-01	*1,65E-14*	*7,04E-10*	*1,10E-09*	2,34E-01	7,75E-01	8,23E-01
Lee96mod	5,00E+16	3,14E-02	*2,20E-13*	*7,10E-10*	*2,74E-10*	3,12E+00	7,82E-01	2,05E-01
Leiden	5,53E+16	2,81E-02	*1,20E-13*	*7,35E-10*	*1,41E-09*	1,71E+00	8,09E-01	1,05E+00
Meijerink	4,98E+16	3,13E-02	*1,12E-13*	*7,42E-10*	*1,37E-09*	1,59E+00	8,17E-01	1,02E+00
Meudon	4,51E+16	2,83E-02	*6,68E-14*	*7,98E-10*	*1,38E-09*	9,47E-01	8,79E-01	1,03E+00
Sternberg	5,00E+16	3,20E-02	*7,05E-14*	*9,08E-10*	*1,34E-09*	1,00E+00	1,00E+00	1,00E+00

Transformation A_V-$A_{V,eff}$



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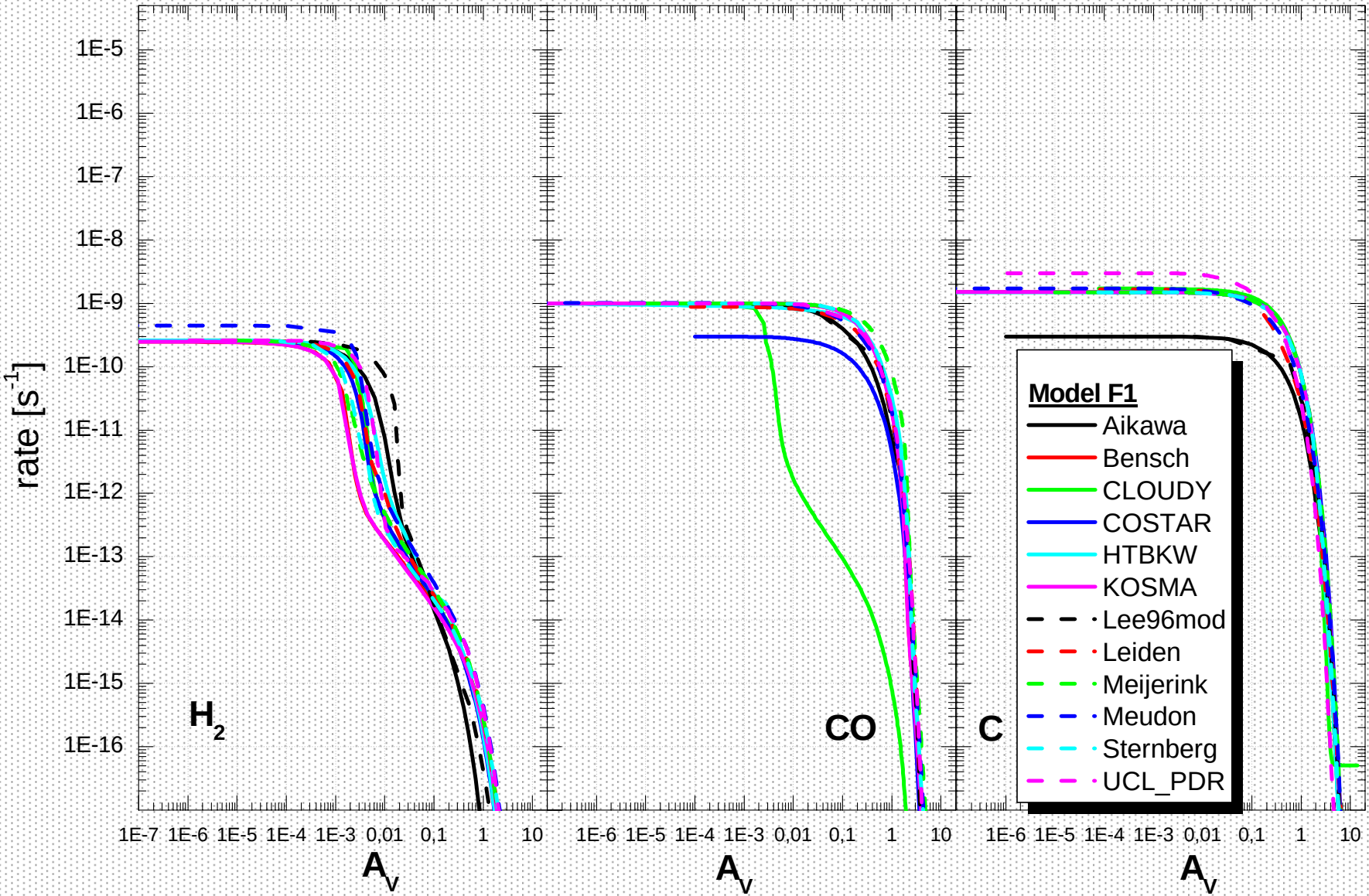

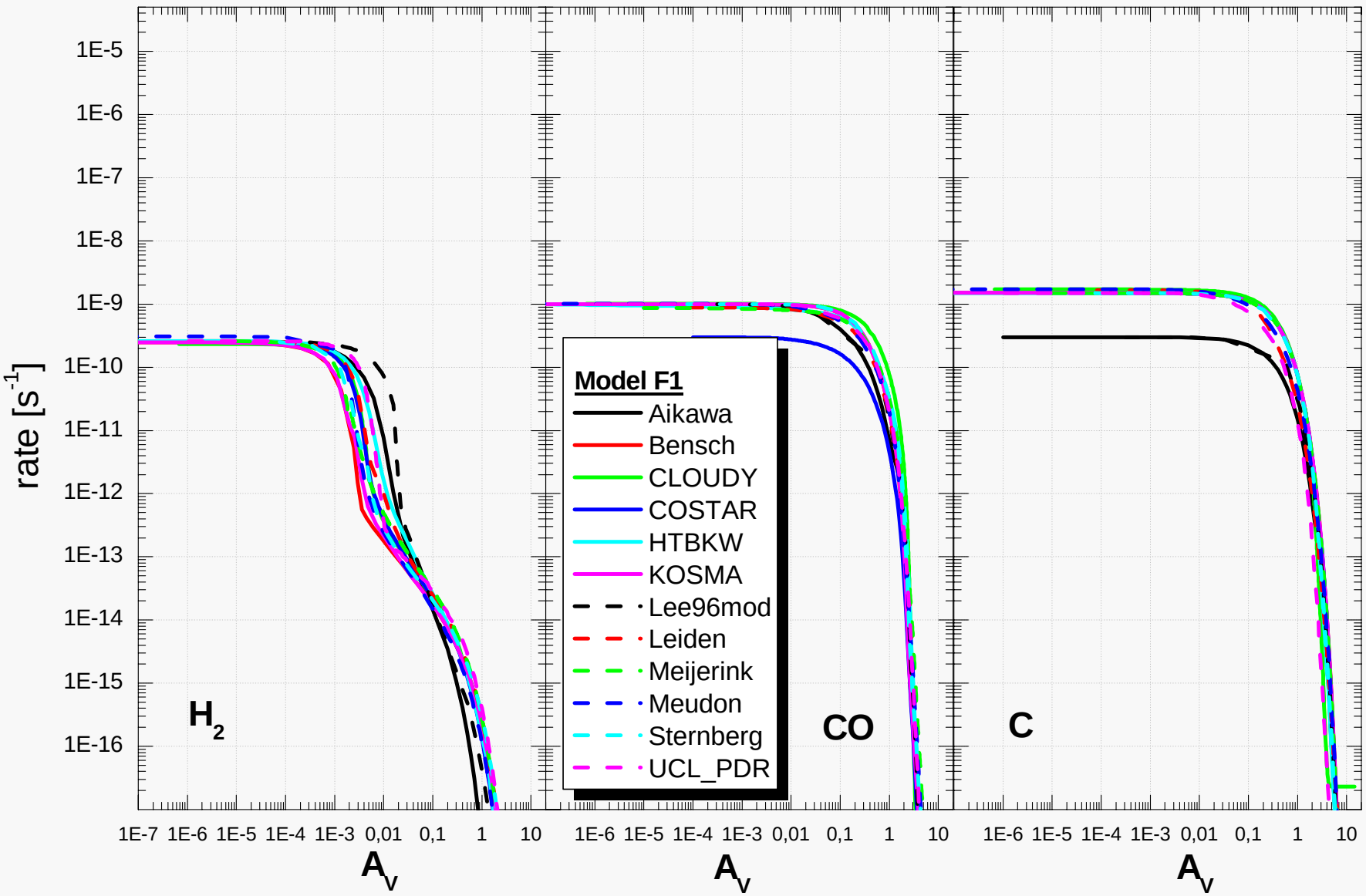
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1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
H2
CO
C
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
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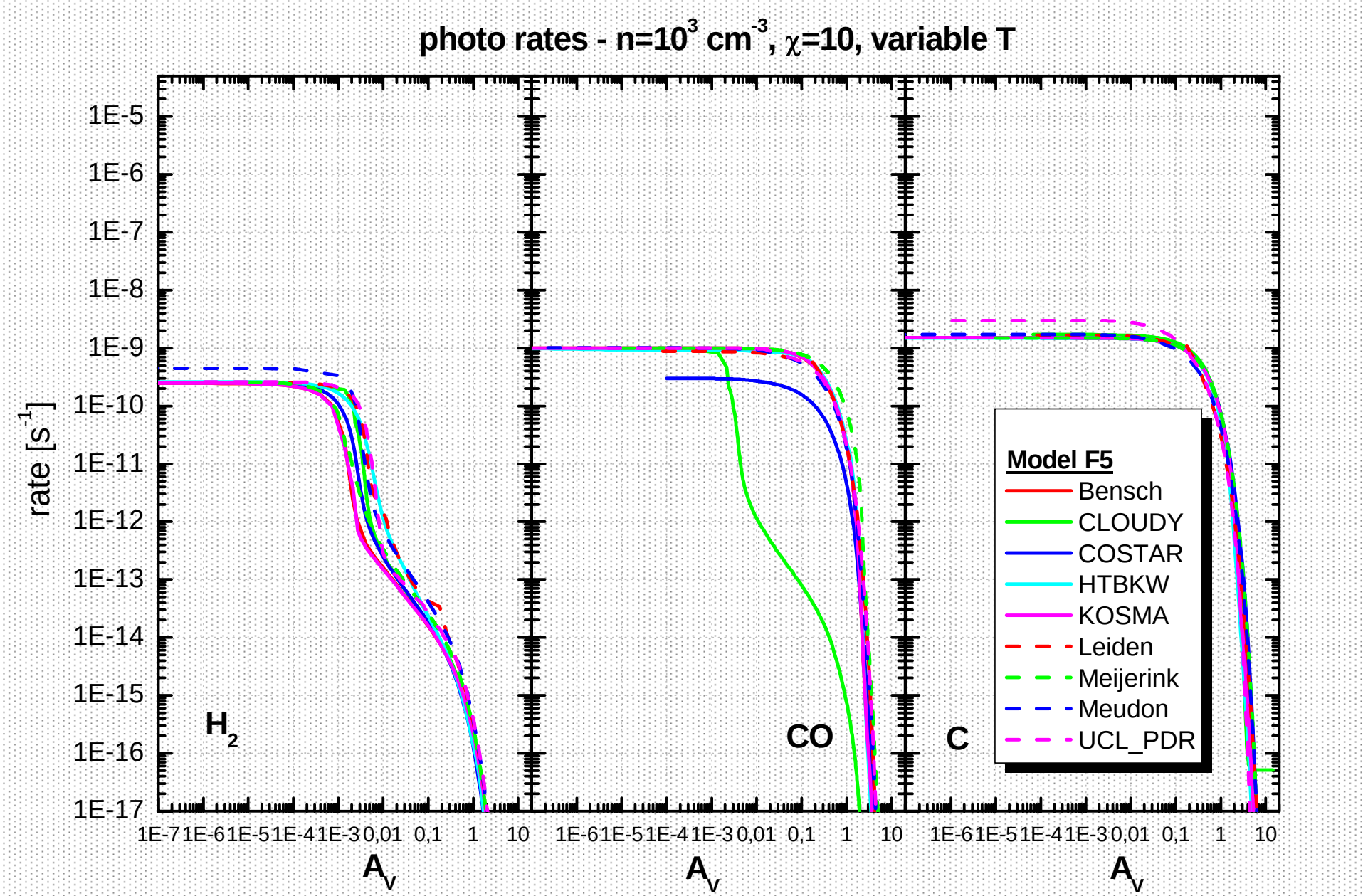
A_V
A_V
A_V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1E-7
1E-8
1E-9
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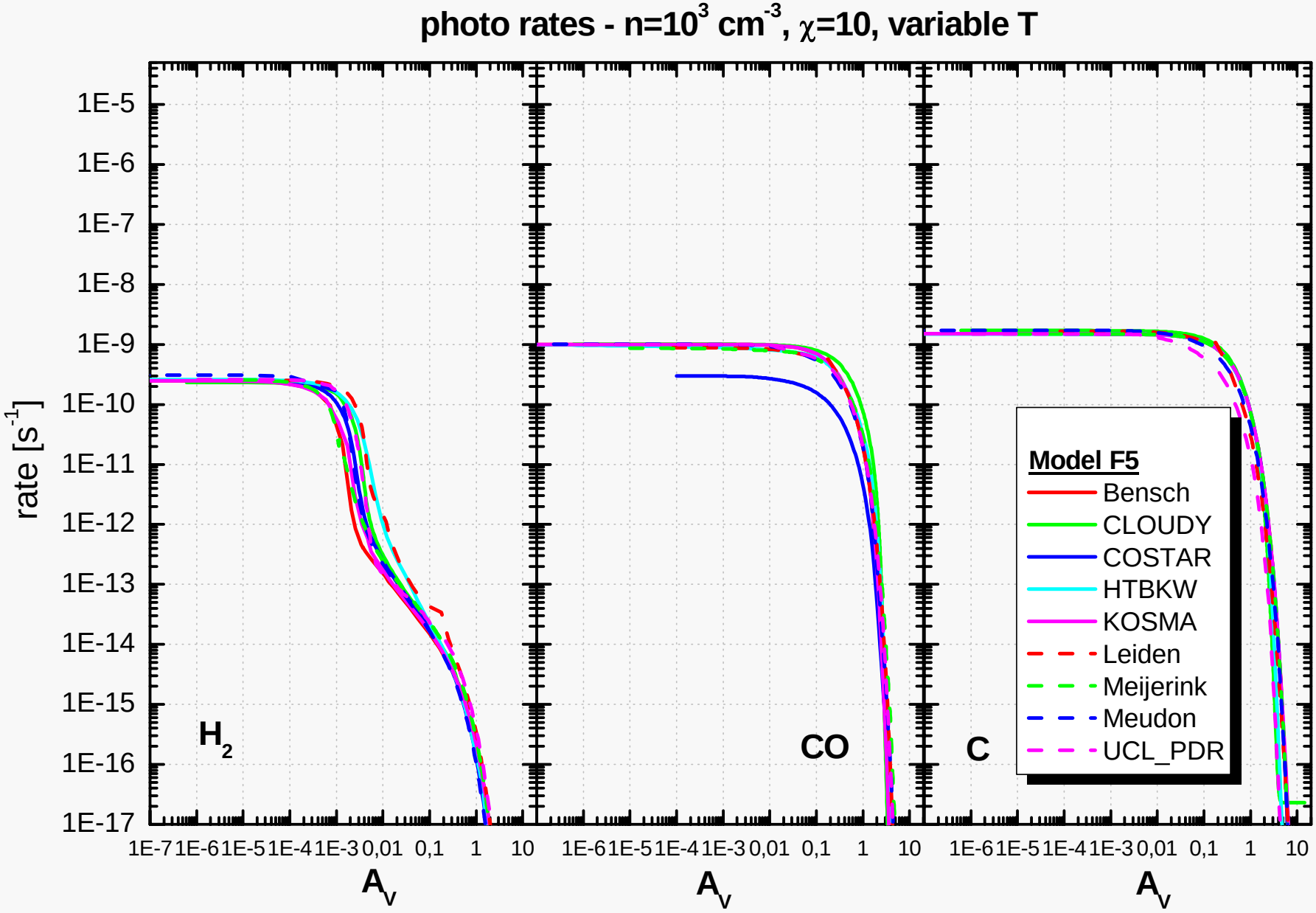
1E-14
1E-15
1E-16
1E-17
H2
CO
C
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR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1E-7
1E-8
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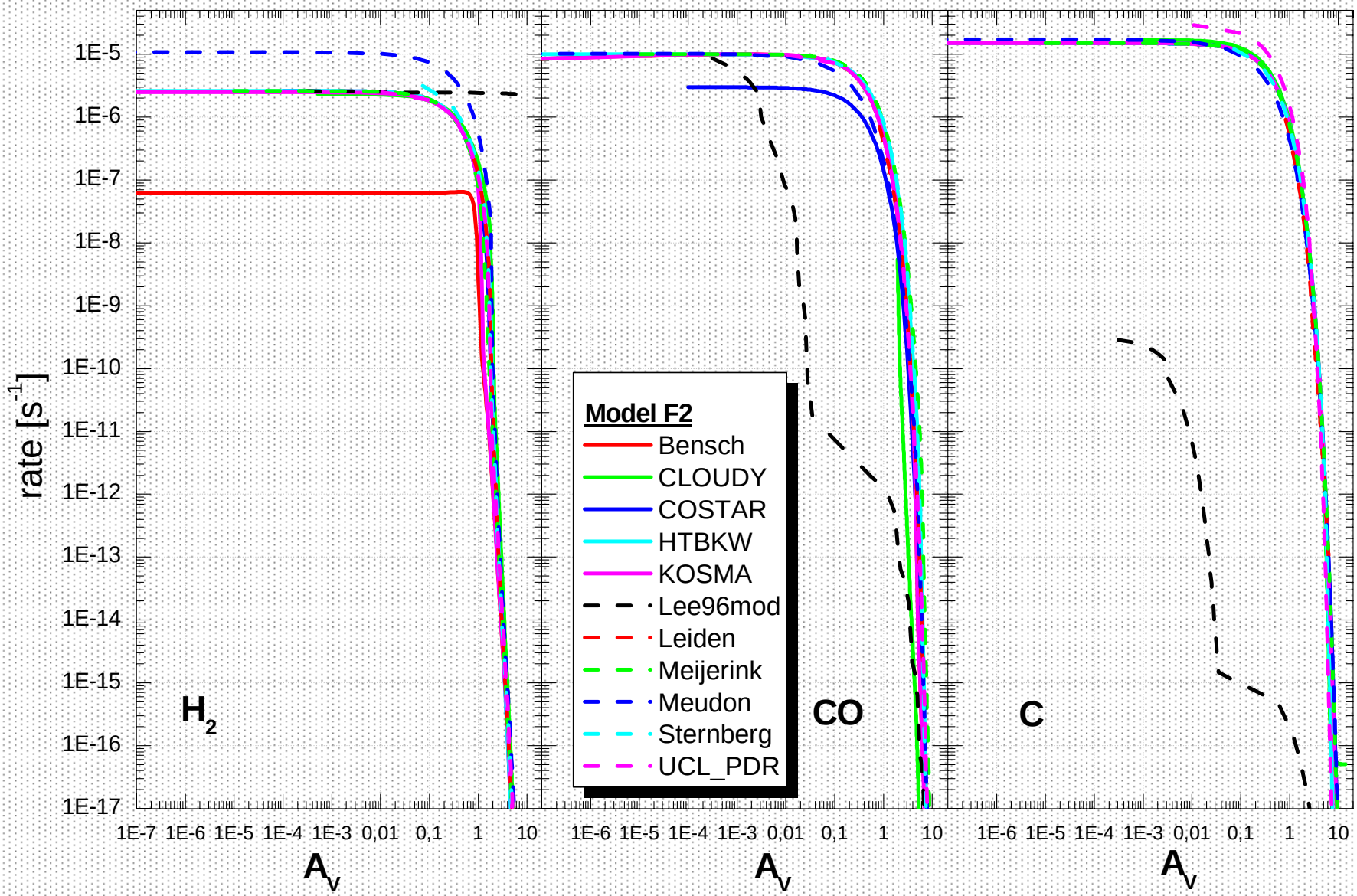
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
H2
CO
C
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V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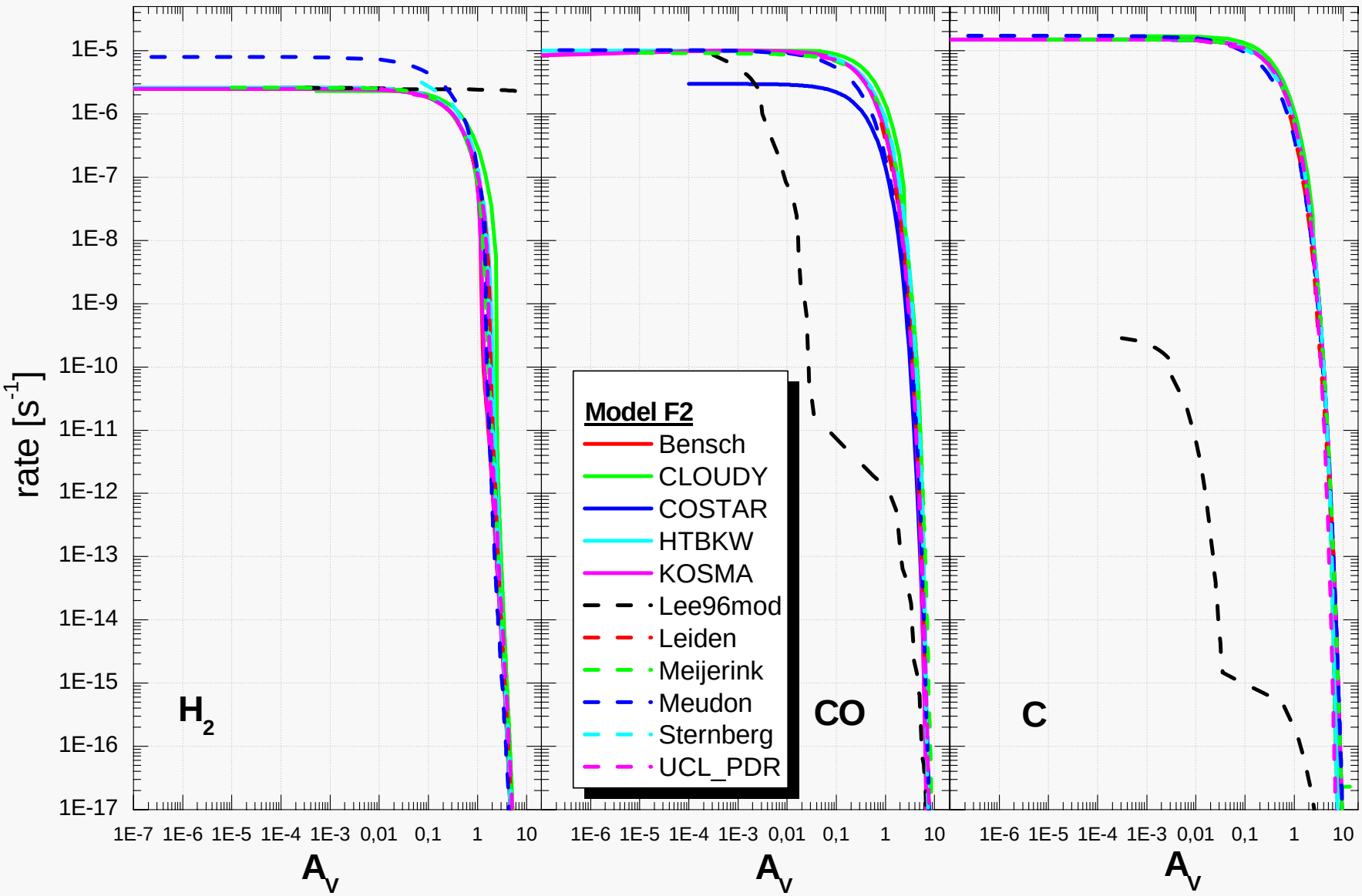
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
A_V
A_V
H_2
CO
C
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR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1E-8
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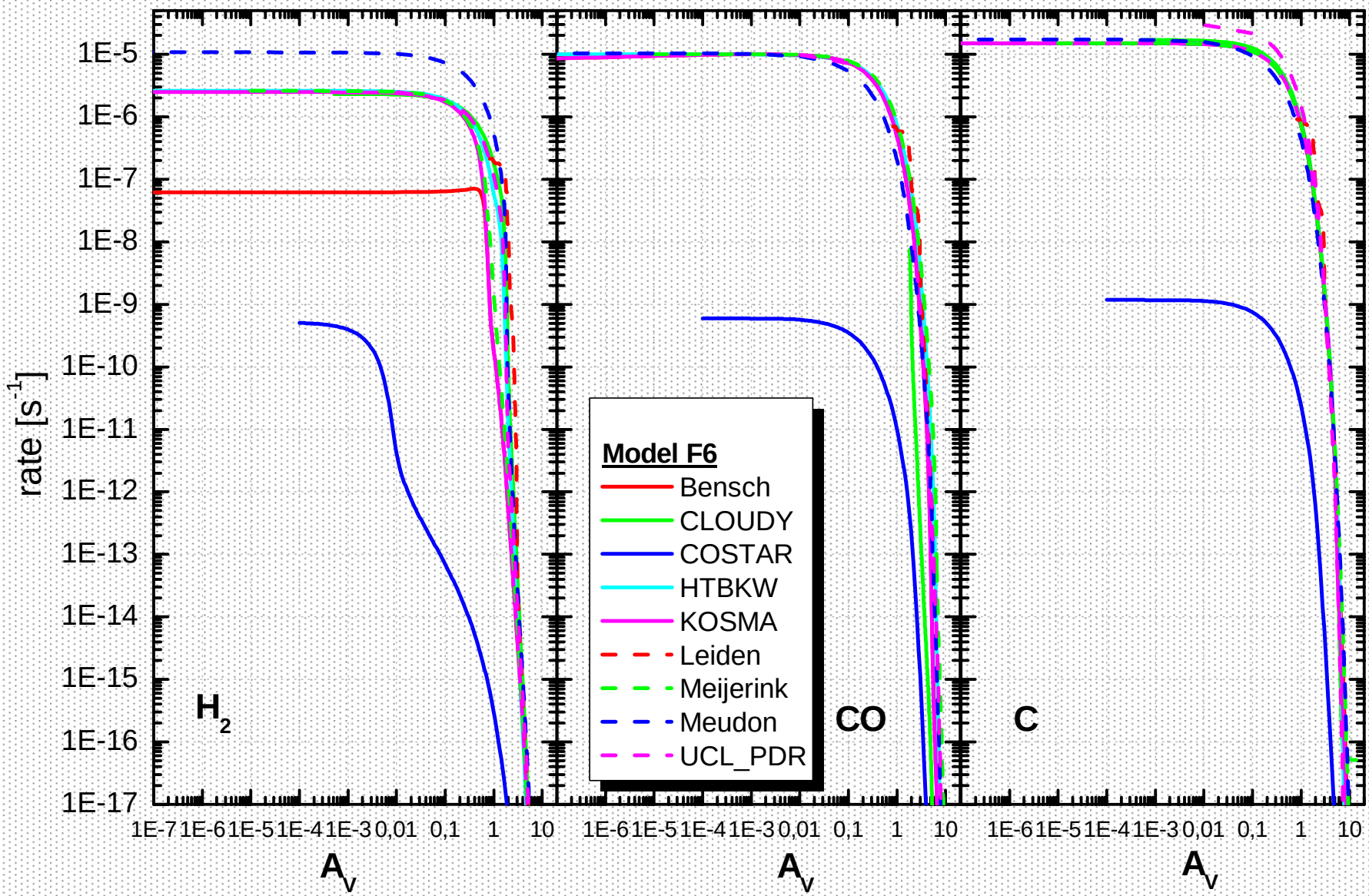
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
A_V
A_V
H_2
CO
C
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR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1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
H2
CO
C
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
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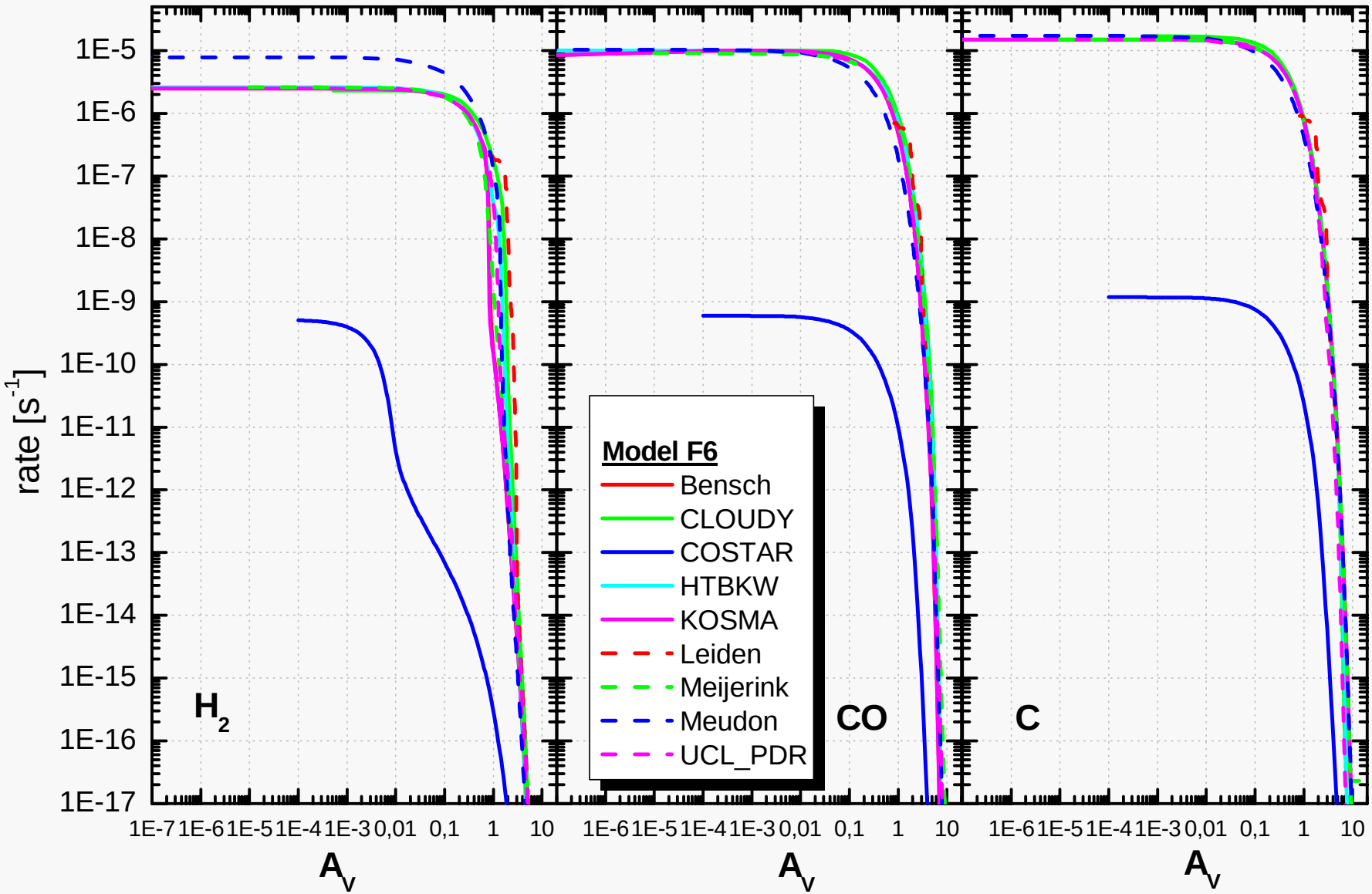
A_V
A_V
A_V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1E-11
1E-12
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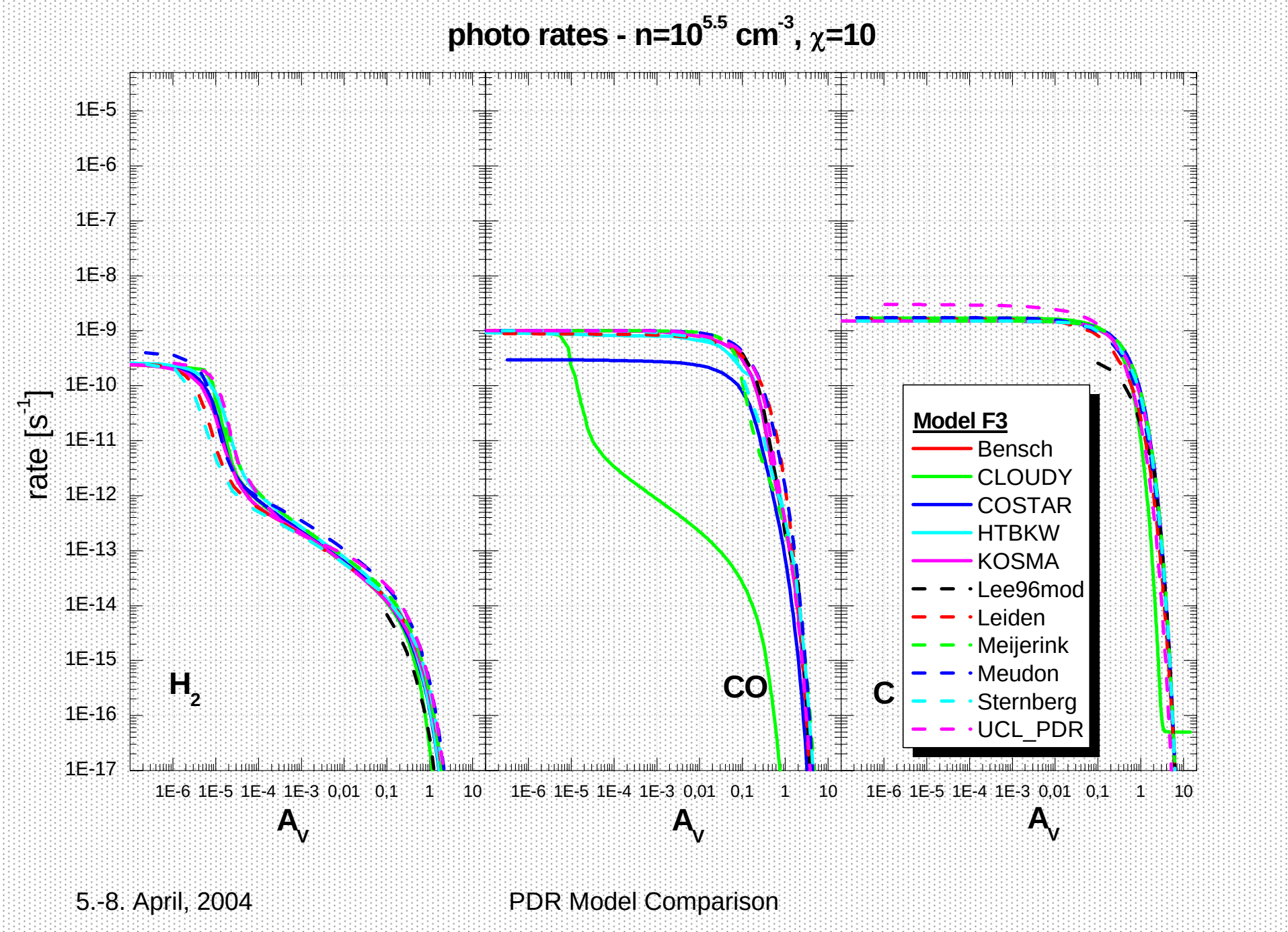
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
H_2
CO
C
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR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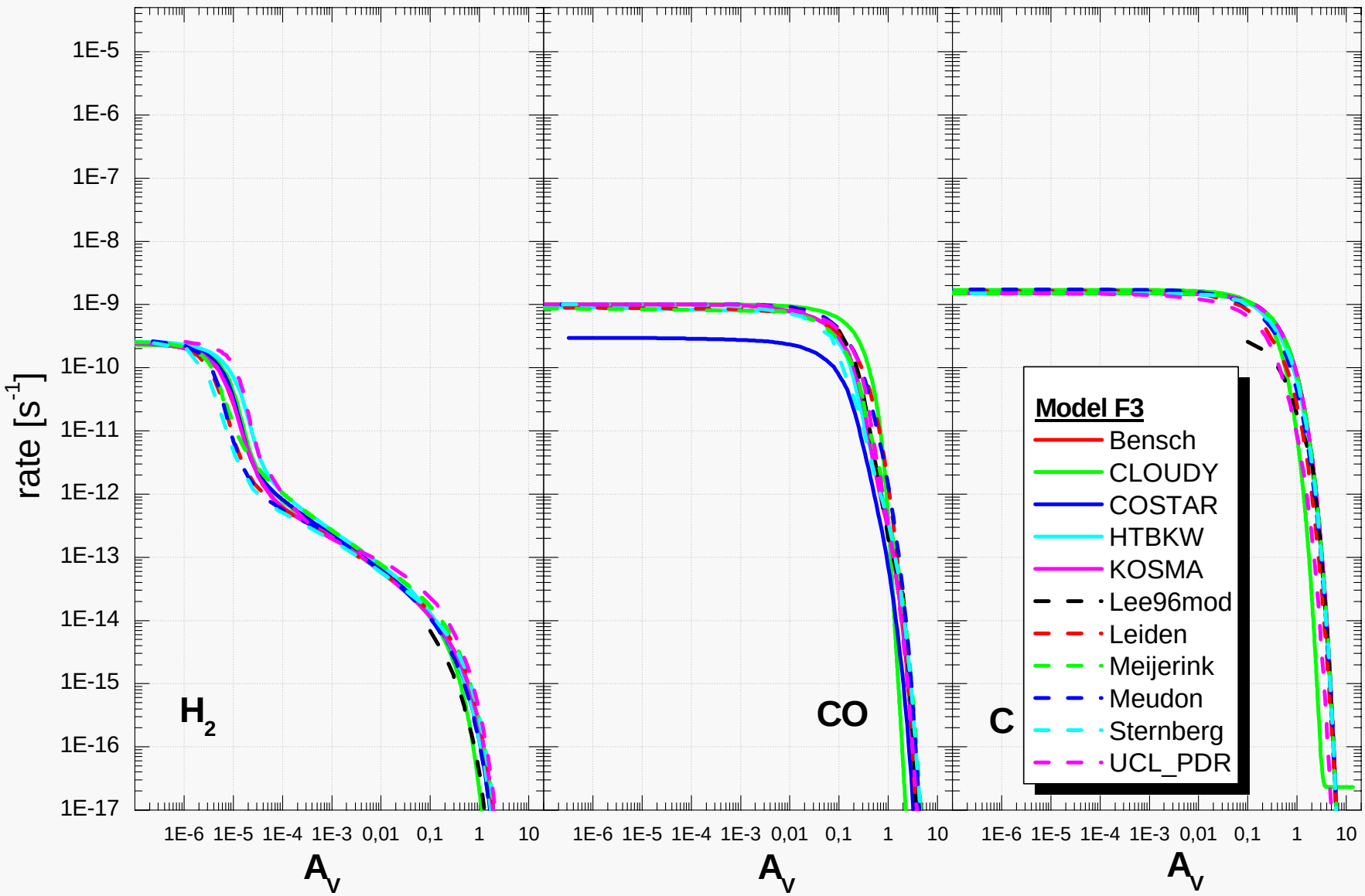
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
H2
CO
C
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
AV
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR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1E-17
H2
CO
C
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
AV
Model F3
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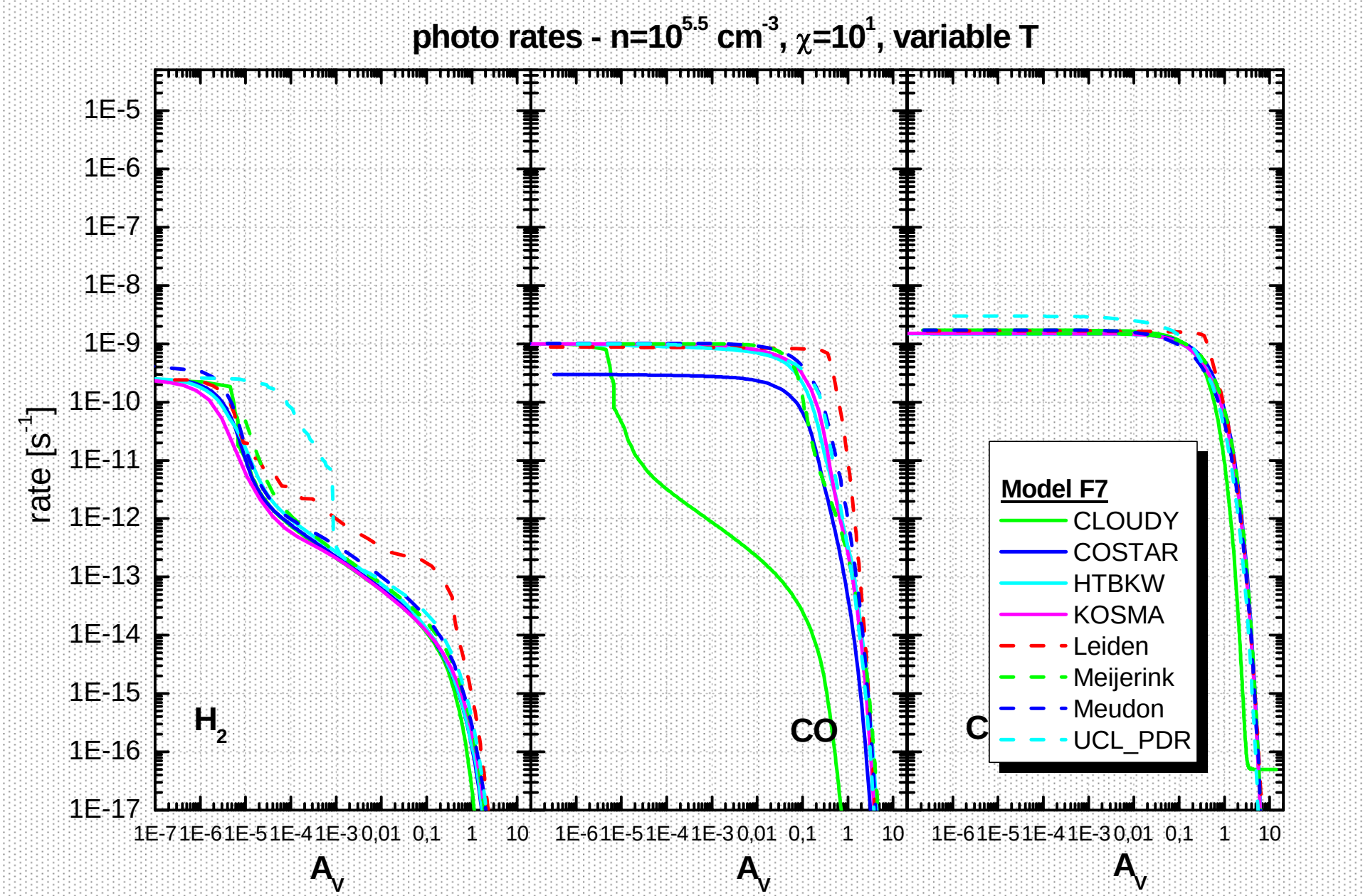
UCL_PDR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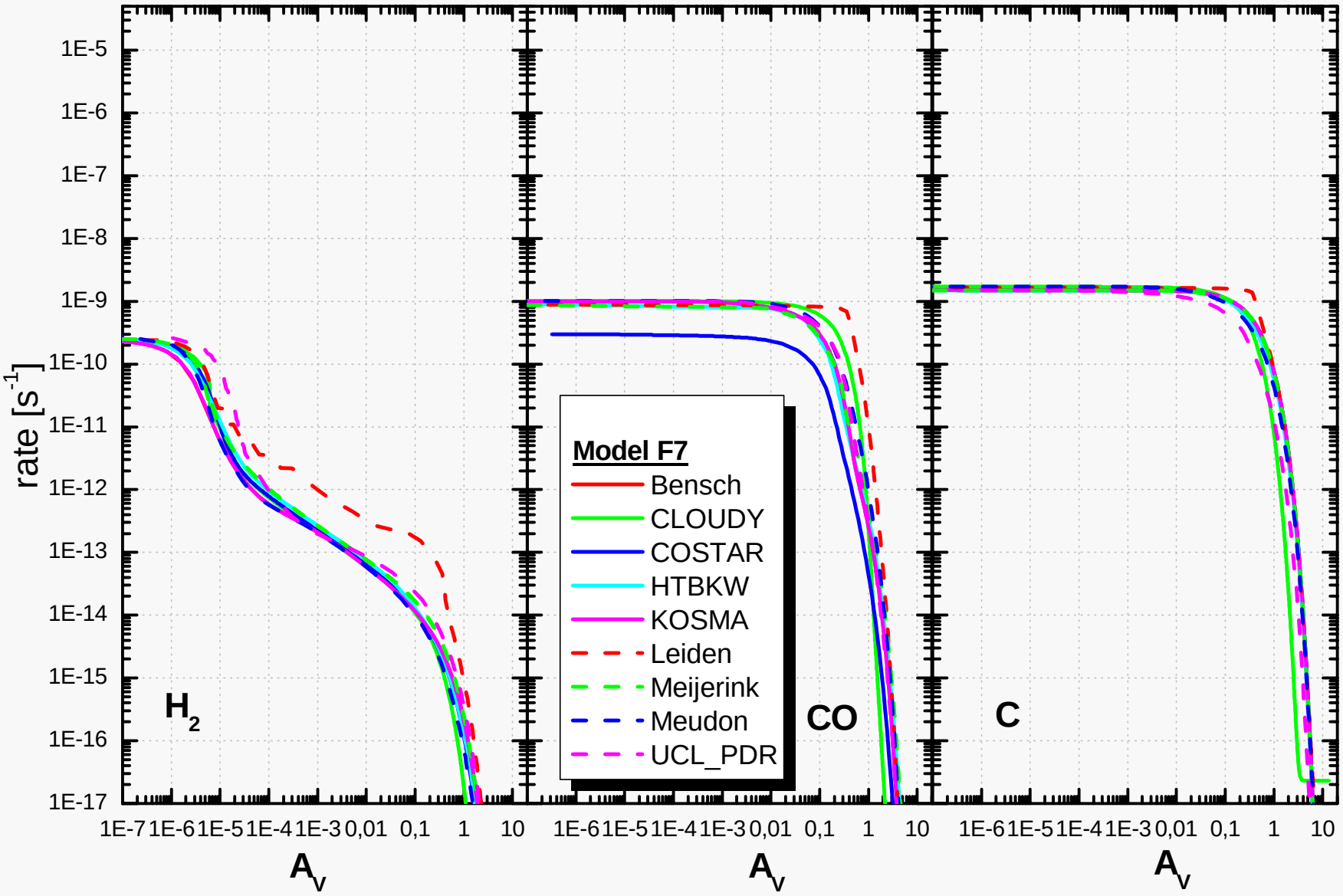
1E-17
H2
CO
C
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
Model F7
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR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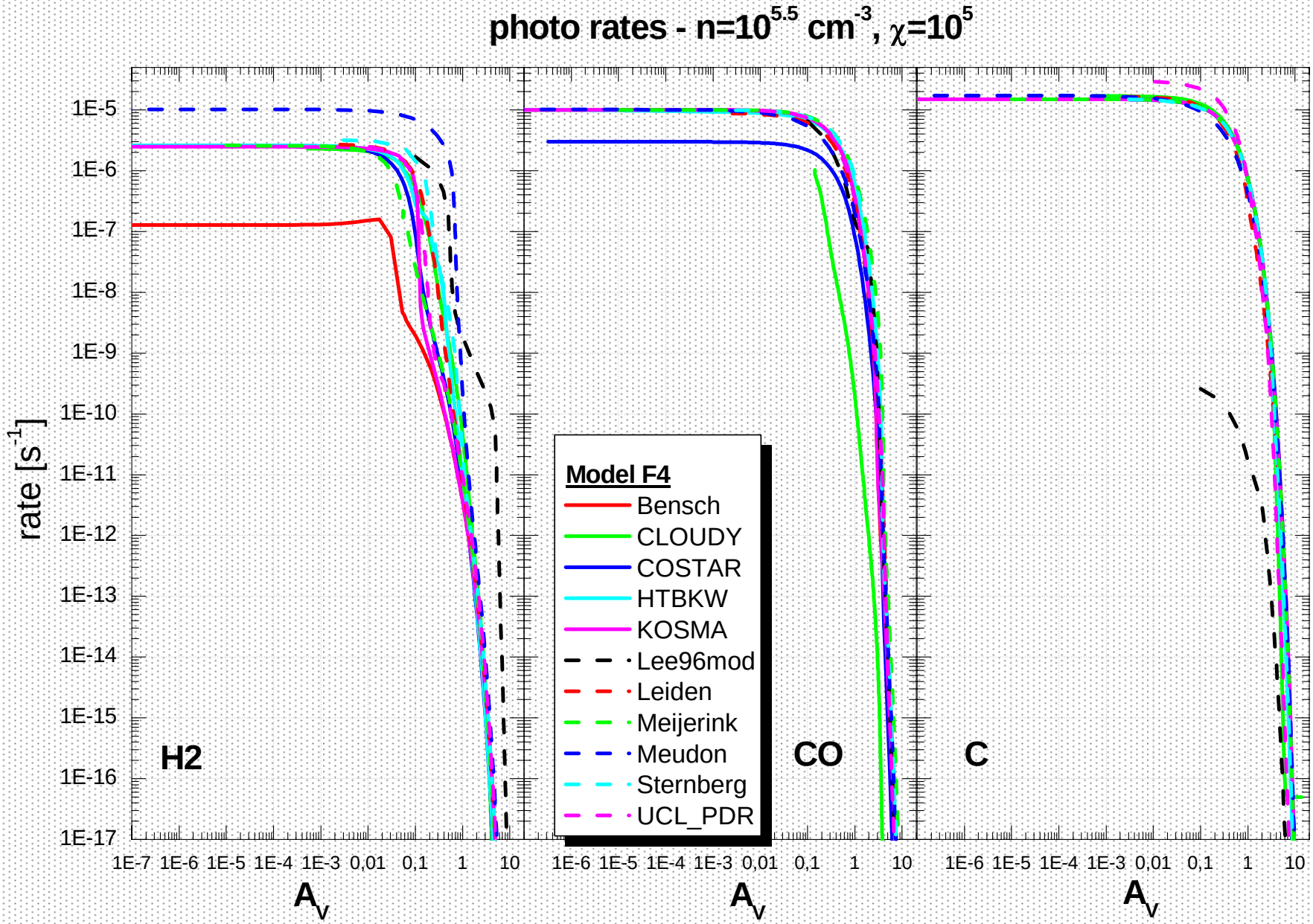
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
H_2
CO
C
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR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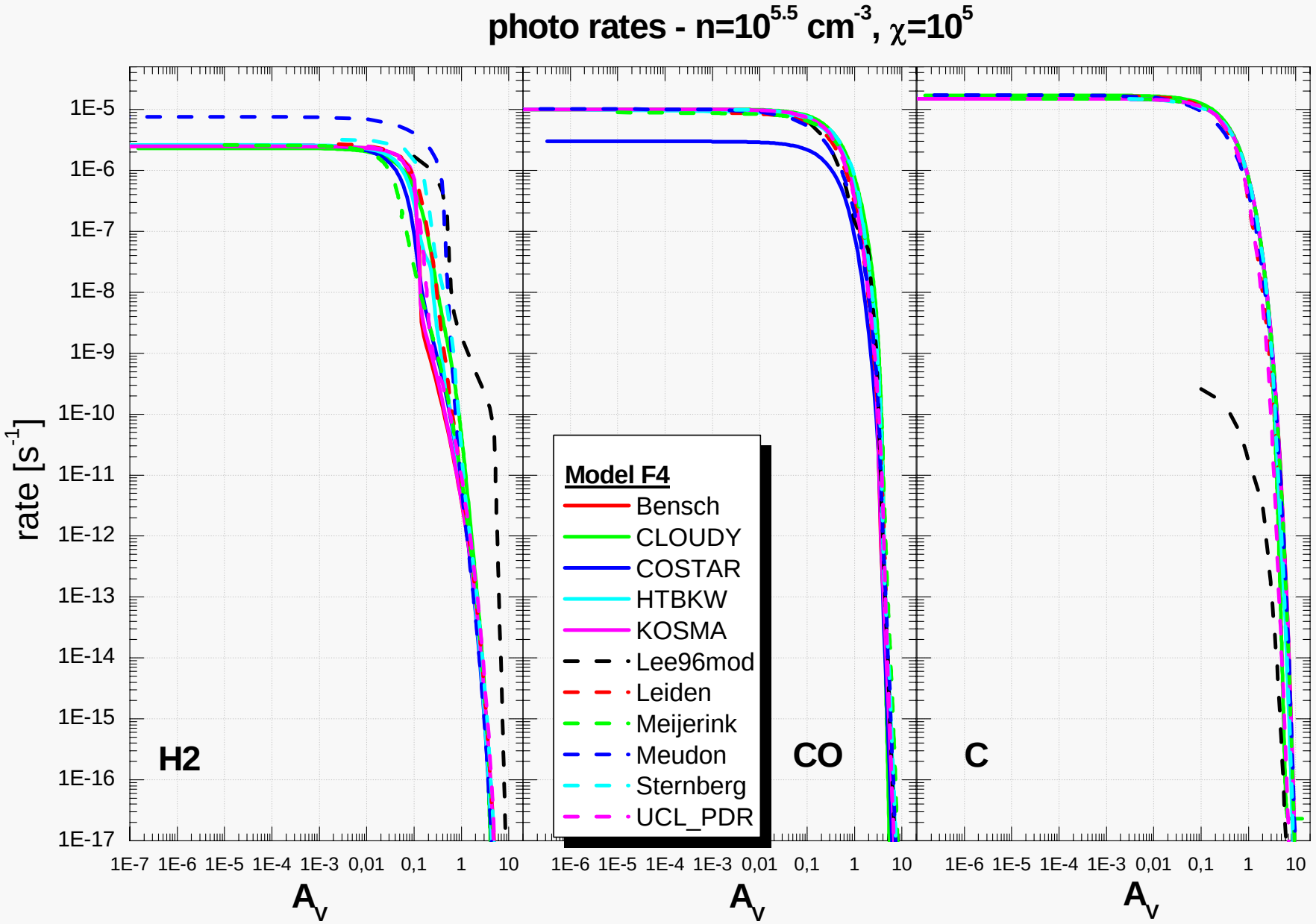
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
H2
CO
C
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
A_V
A_V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1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
H2
CO
C
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
A_V
A_V

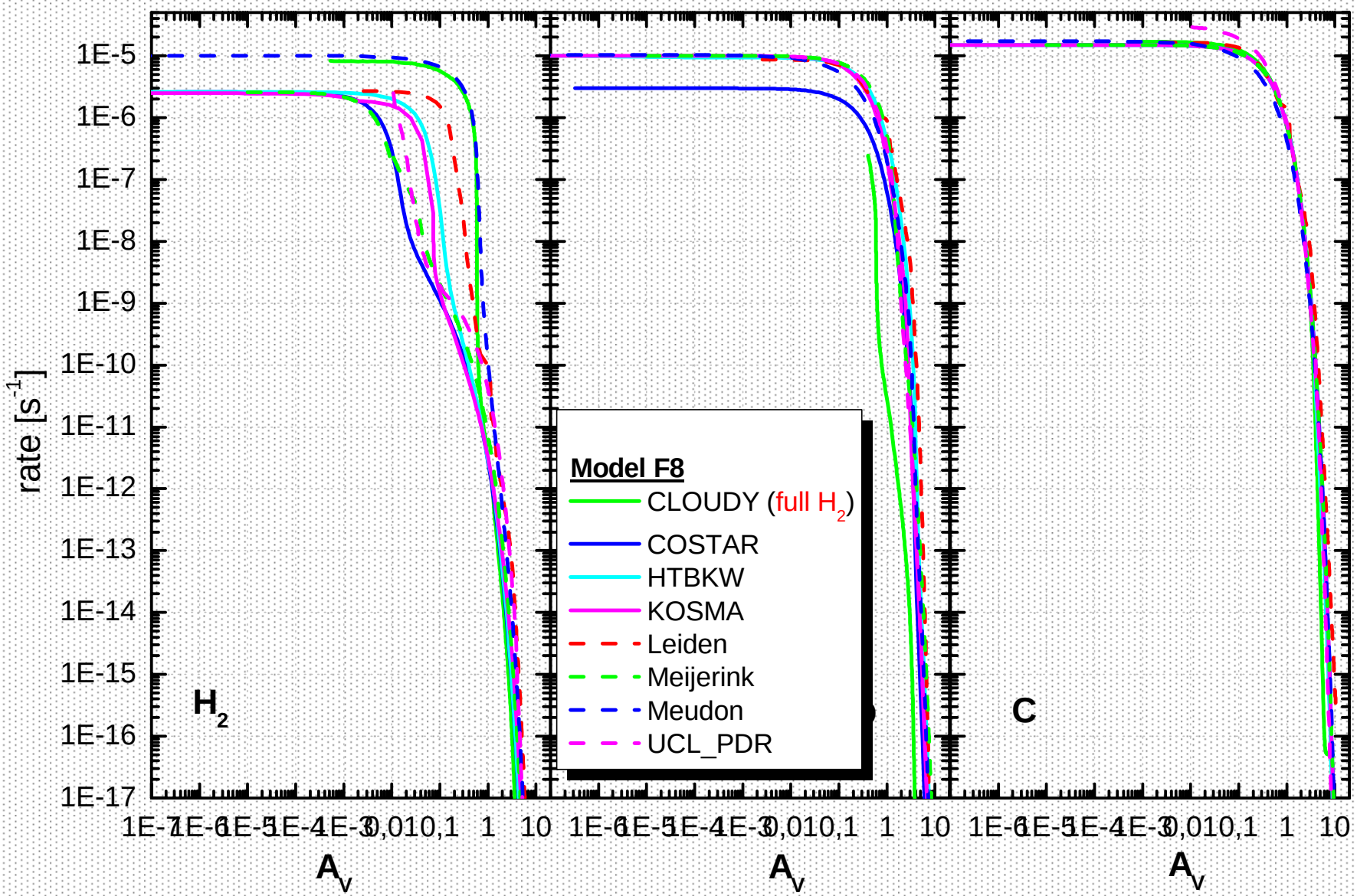


photo rates - n=10^5.5 cm^-3, χ=10^5, variable T
rate [s^-1]
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
H_2
C
Model F8
CLOUDY (full H_2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

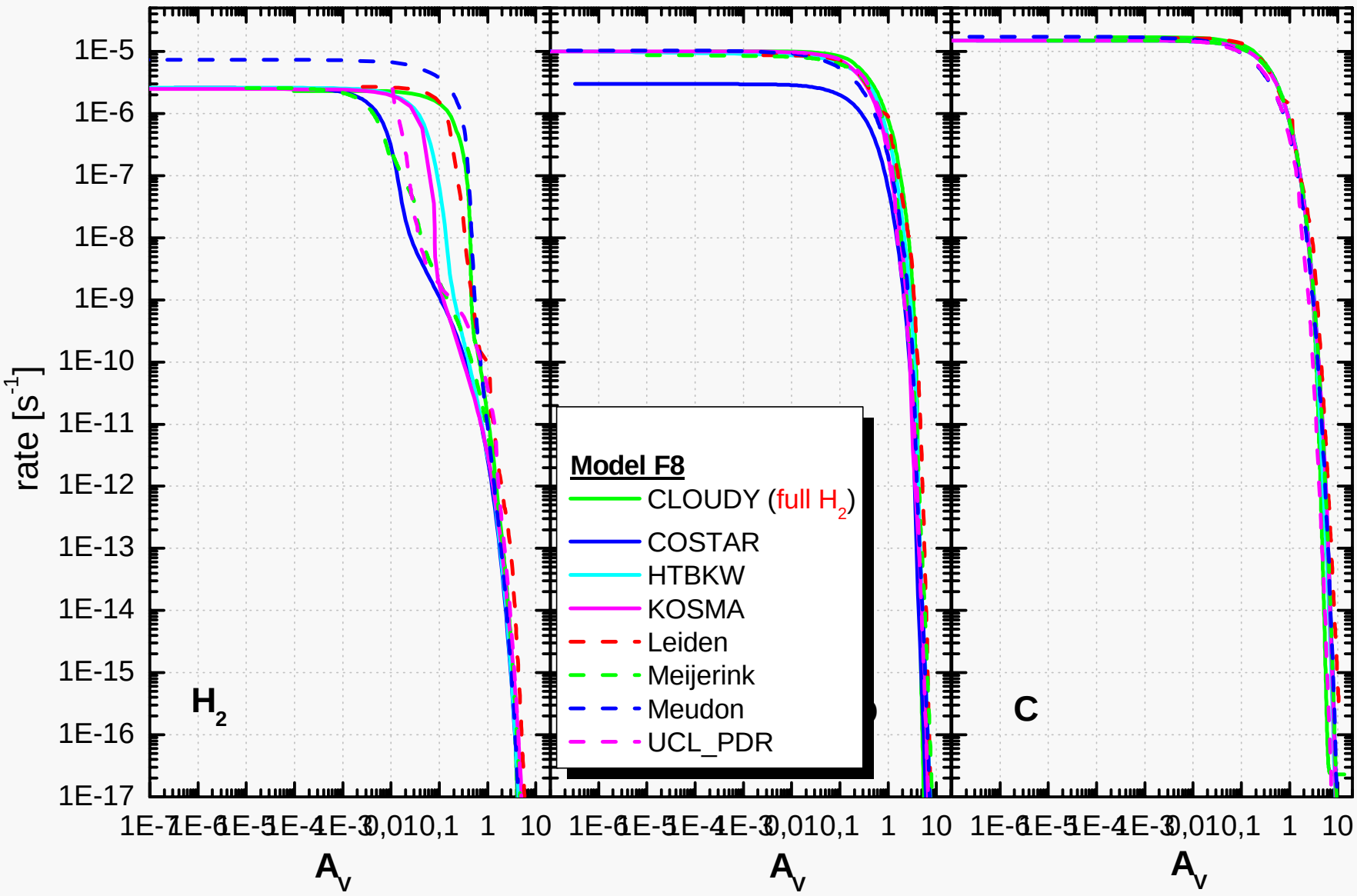
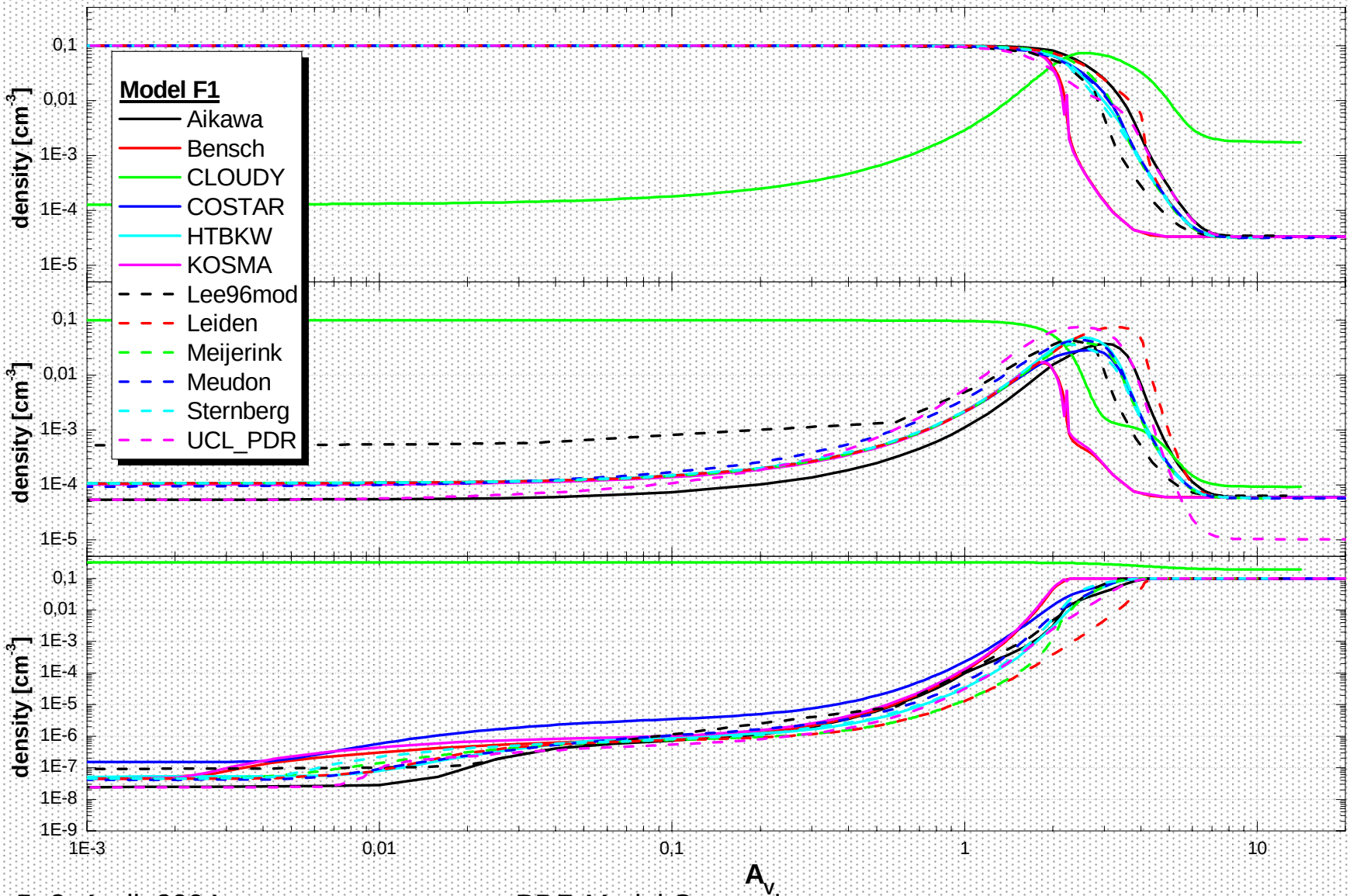


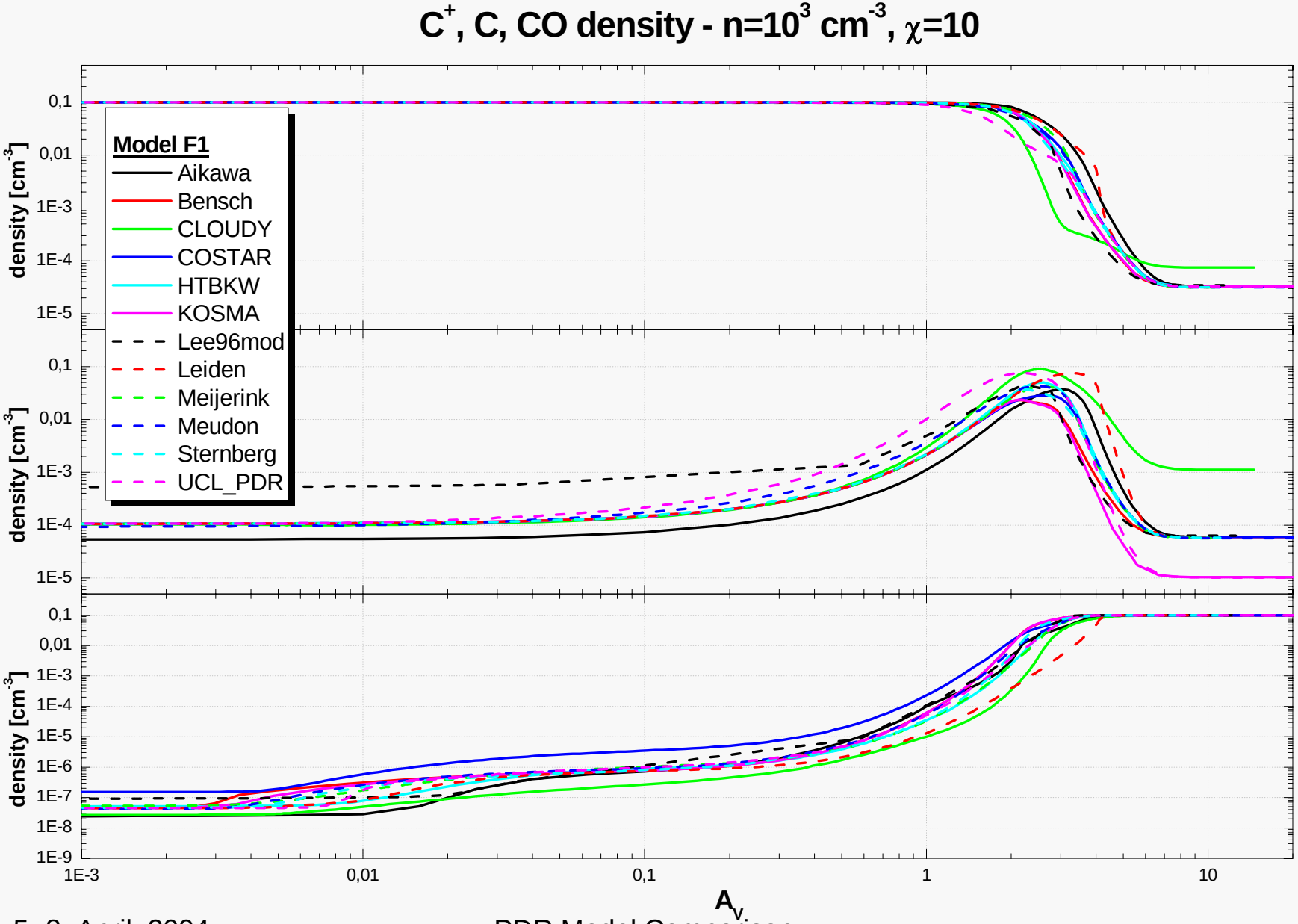
photo rates - n=10^5.5 cm^-3, χ=10^5, variable T
rate [s^-1]
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-7 1E-6 1E-5 1E-4 1E-3 0,01 0,1 1 10
A_V
H_2
C
Model F8
CLOUDY (full H_2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

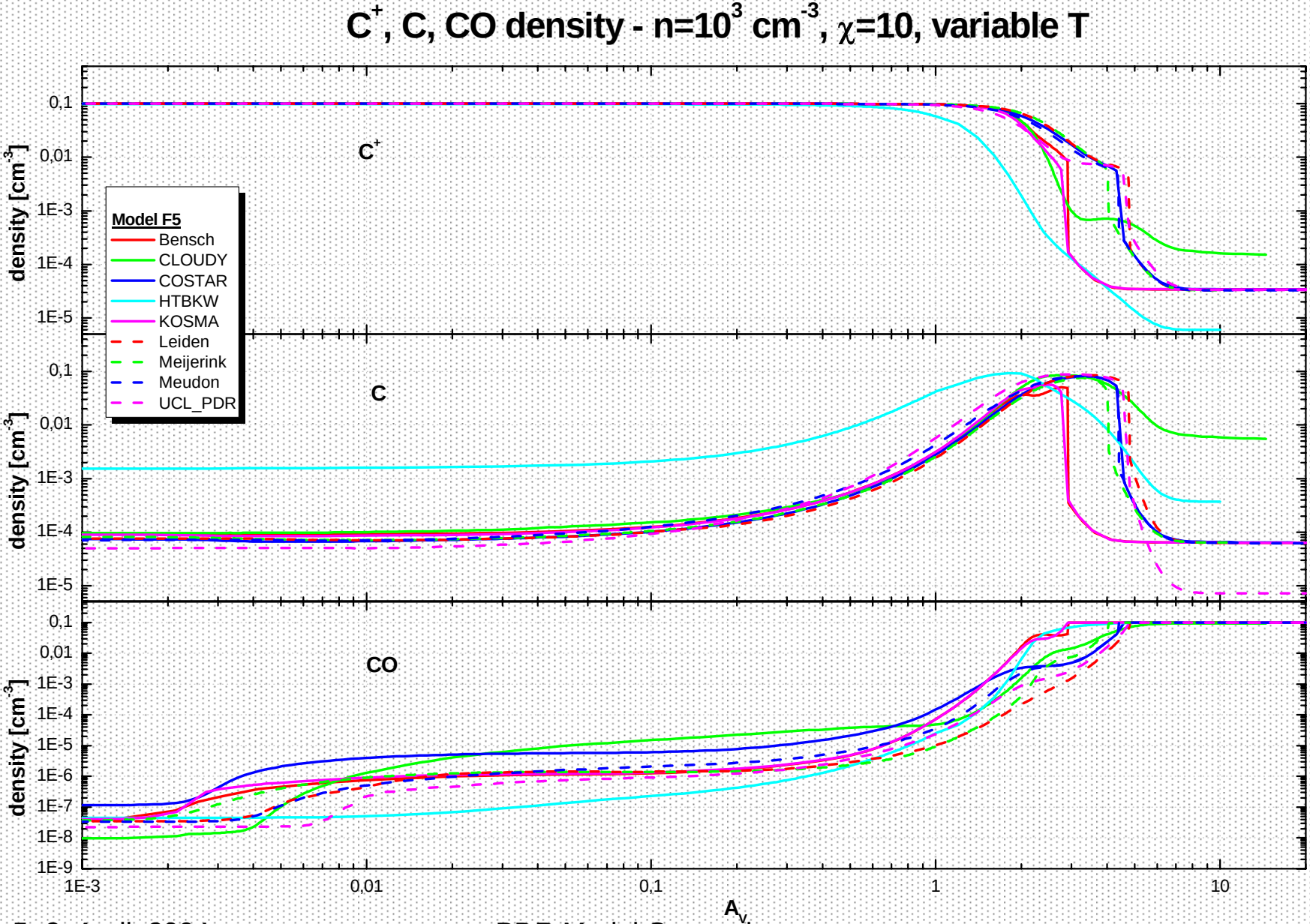
Model Results F1-F4

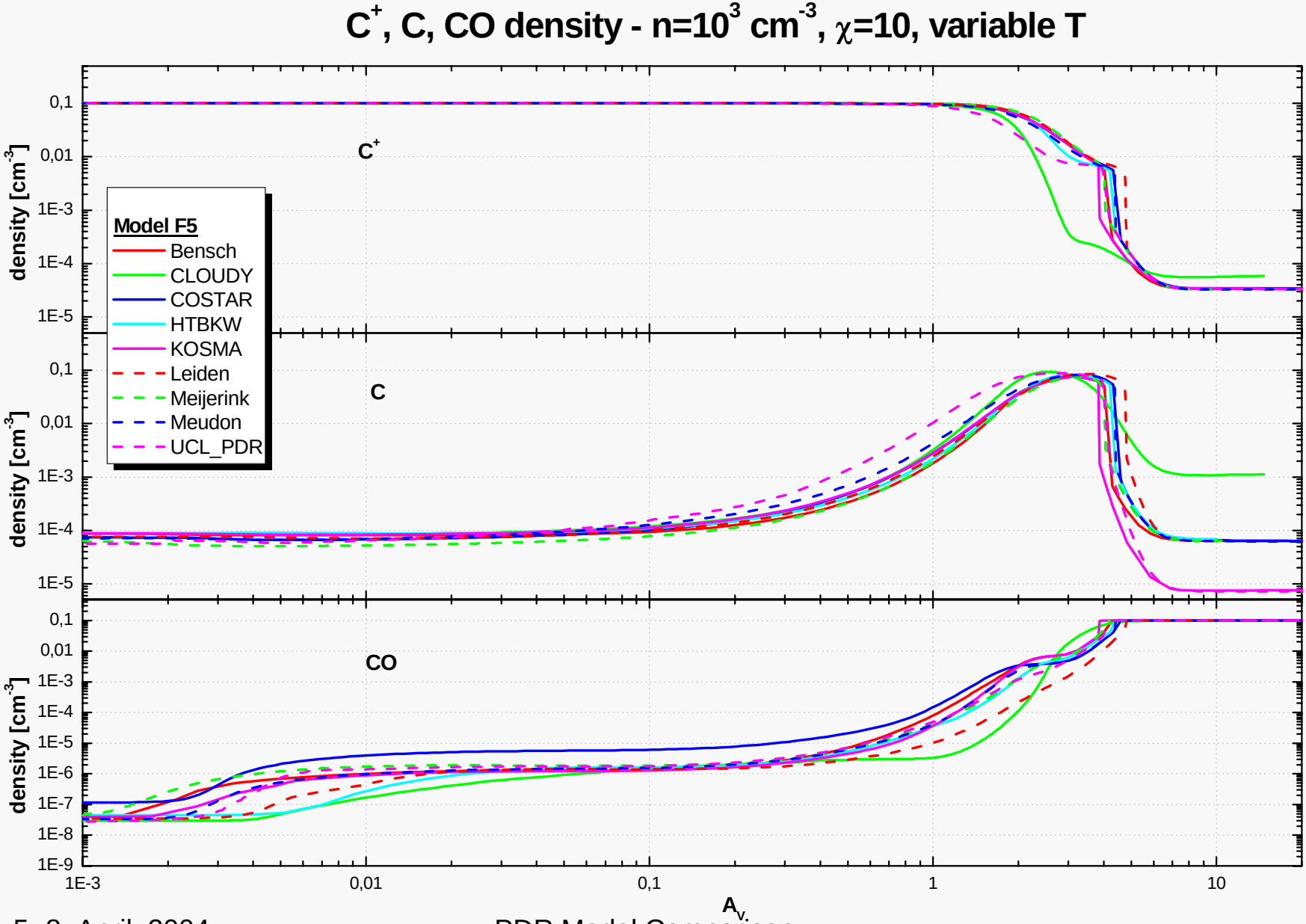
- photoreaction rates
- densities
- heating/cooling rates
- surface brightnesses

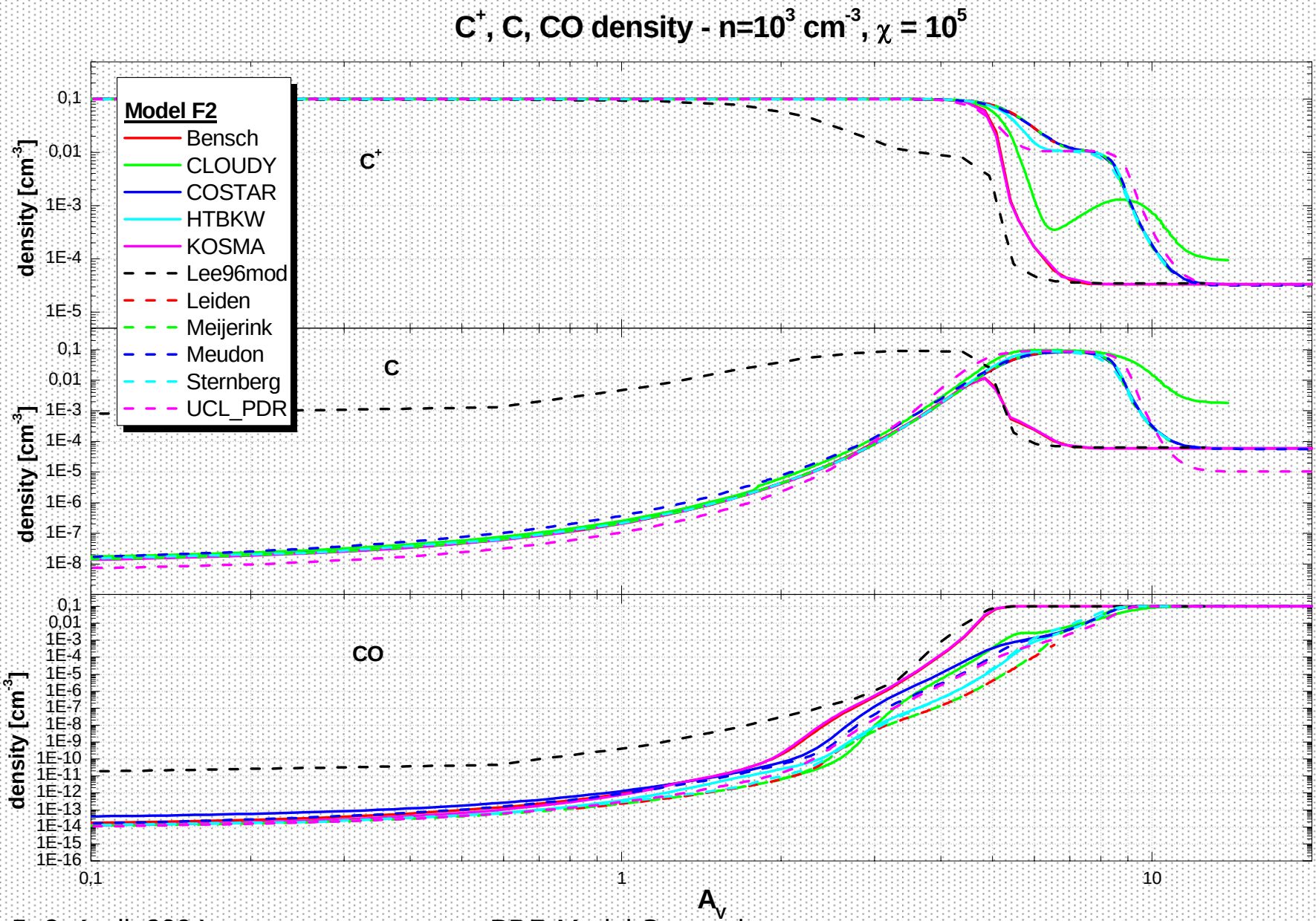
C^+, C, and CO density

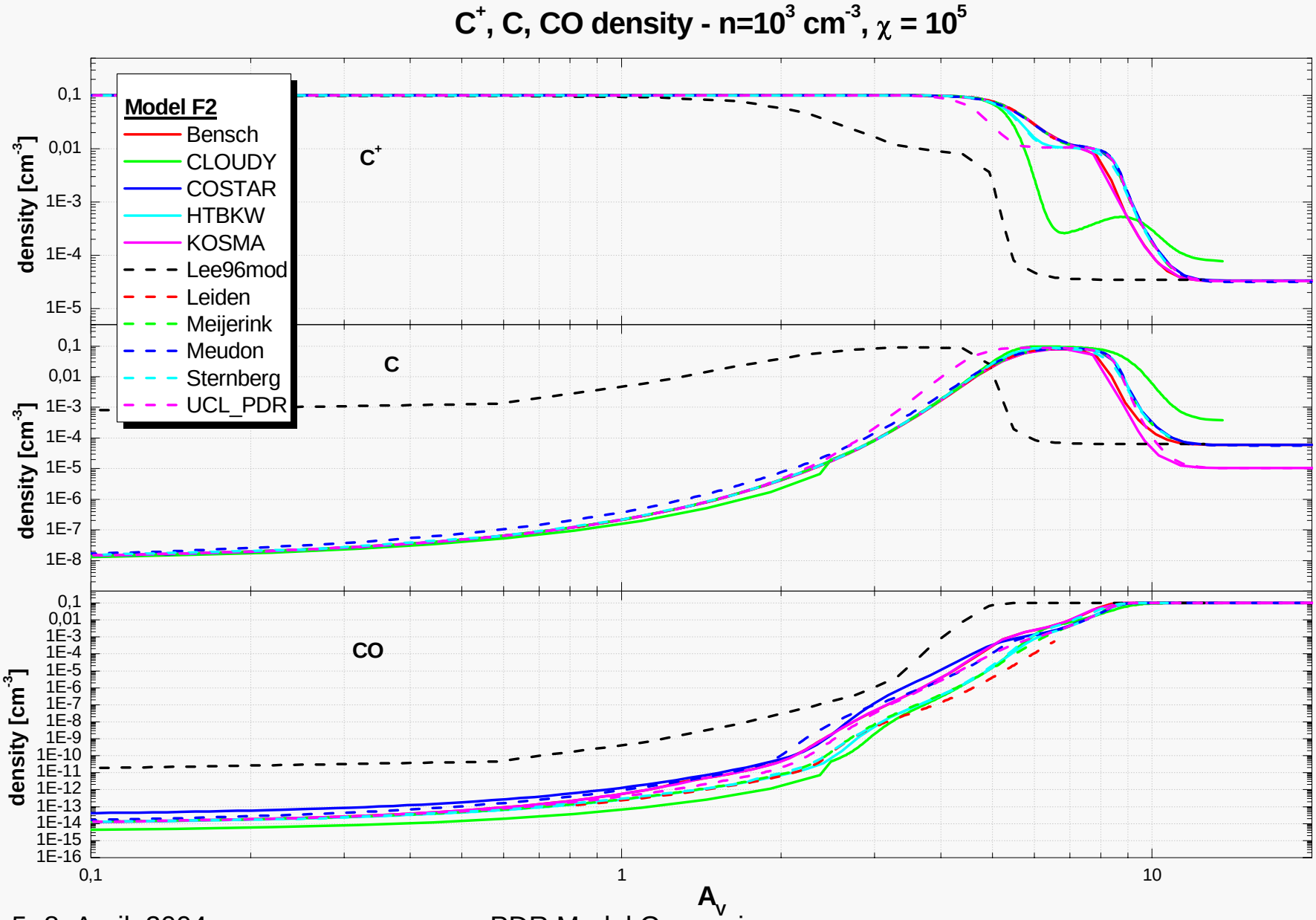

C+, C, CO density - n=10^3 cm^-3, χ=10
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-3
0,01
0,1
1
10
A_V

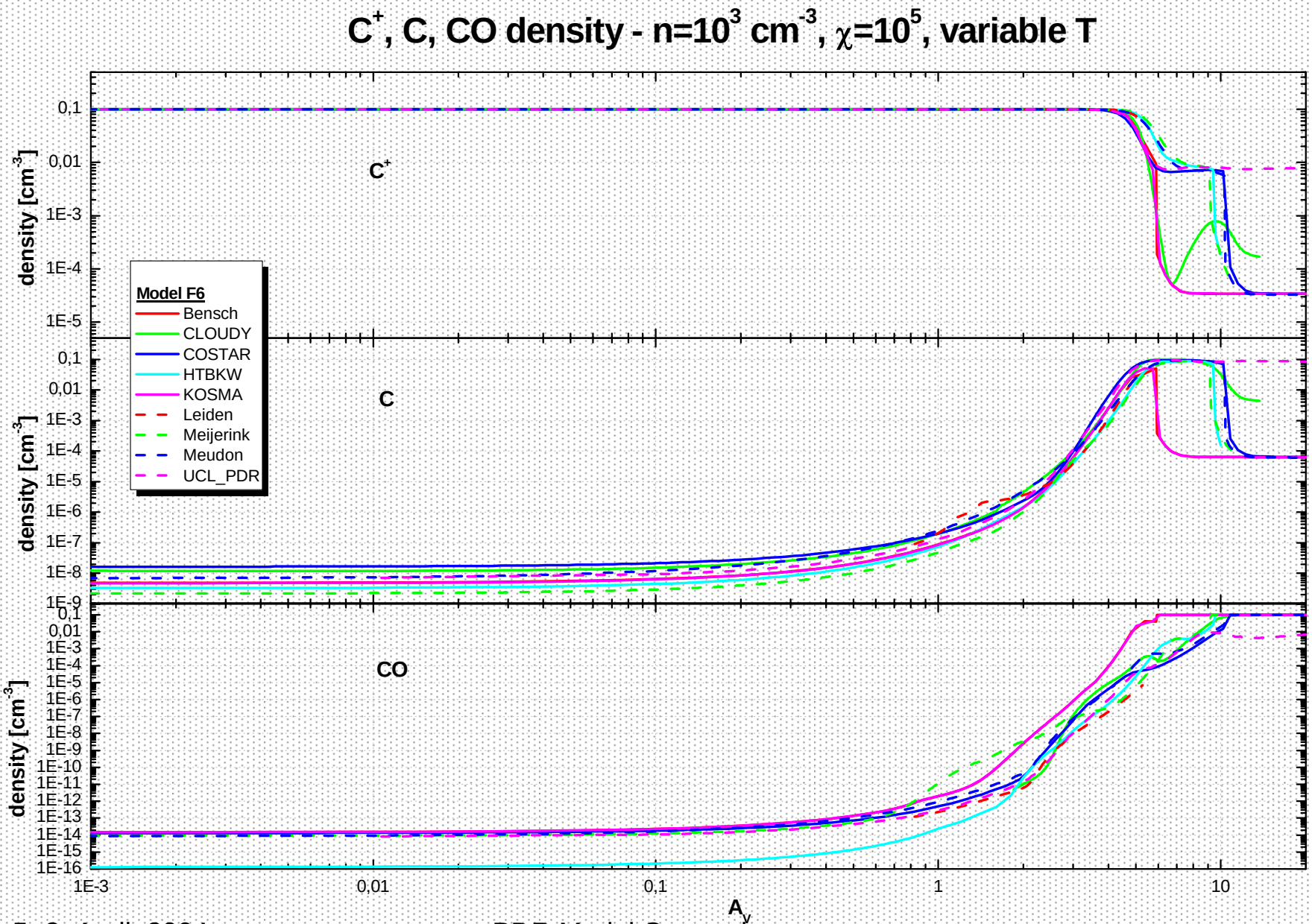

C+, C, CO density - n=10^3 cm^-3, χ=10
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

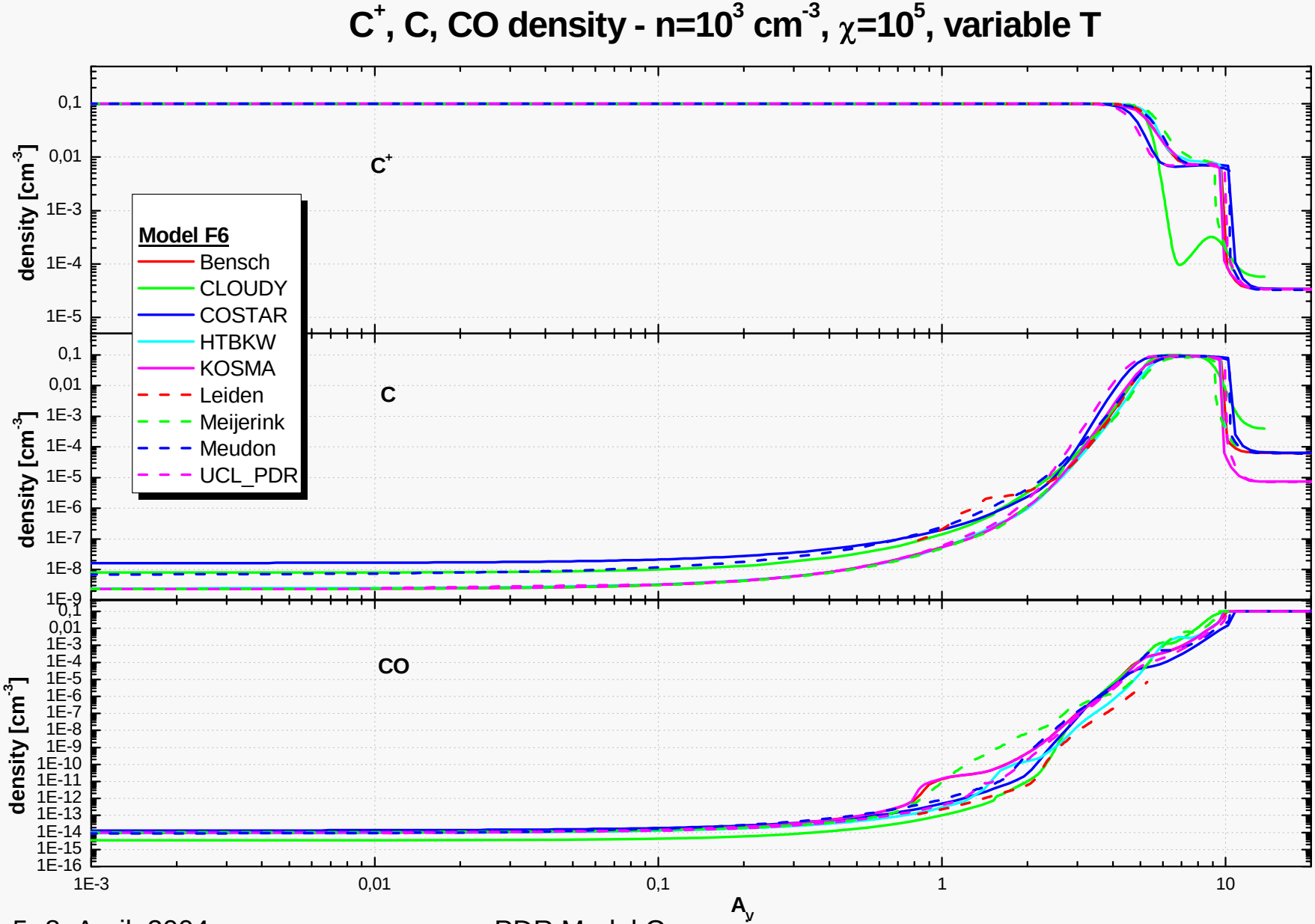

C+, C, CO density - n=10^3 cm^-3, χ=10, variable T
density [cm^-3]
C+
C
CO
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-3
0,01
0,1
1
10
A_V

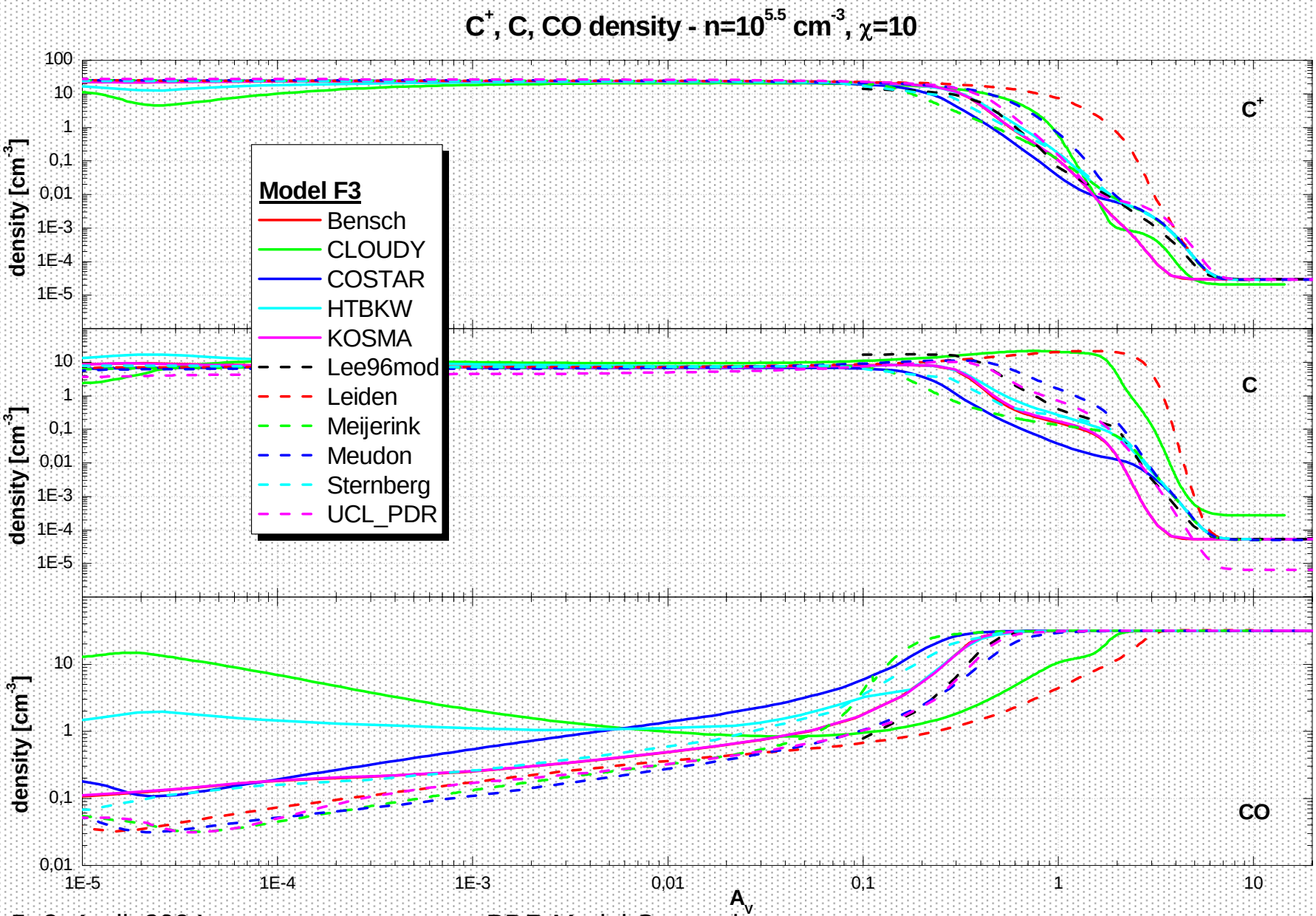

C+, C, CO density - n=10^3 cm^-3, χ=10, variable T
density [cm^-3]
C+
C
CO
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-3
0,01
0,1
1
10
A_V

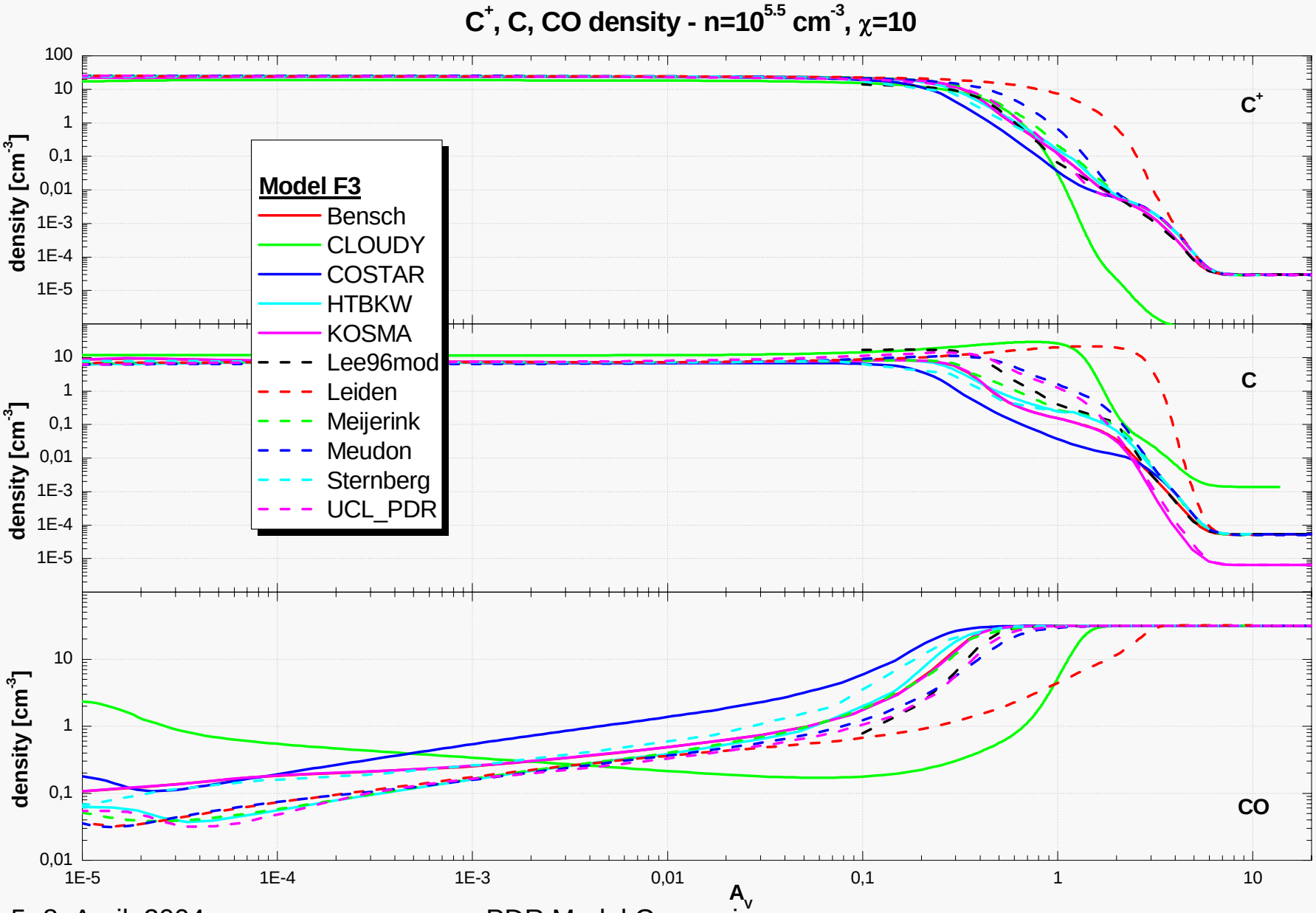

C+, C, CO density - n=10^3 cm^-3, χ = 10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
C+
C
CO
density [cm^-3]
A_V

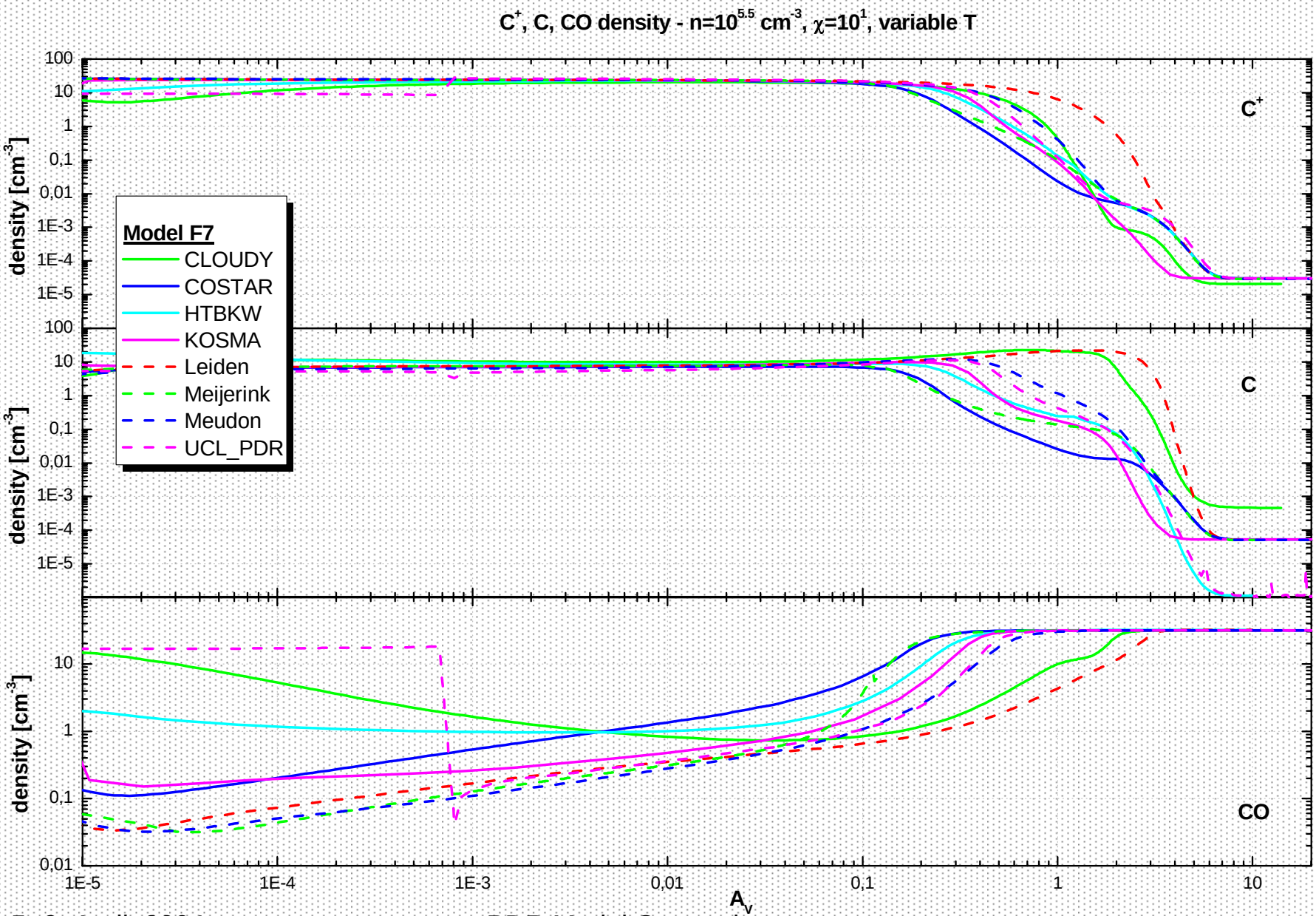

C+, C, CO density - n=10^3 cm^-3, χ = 10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
C+
C
CO
density [cm^-3]
A_V
0,1
1
10

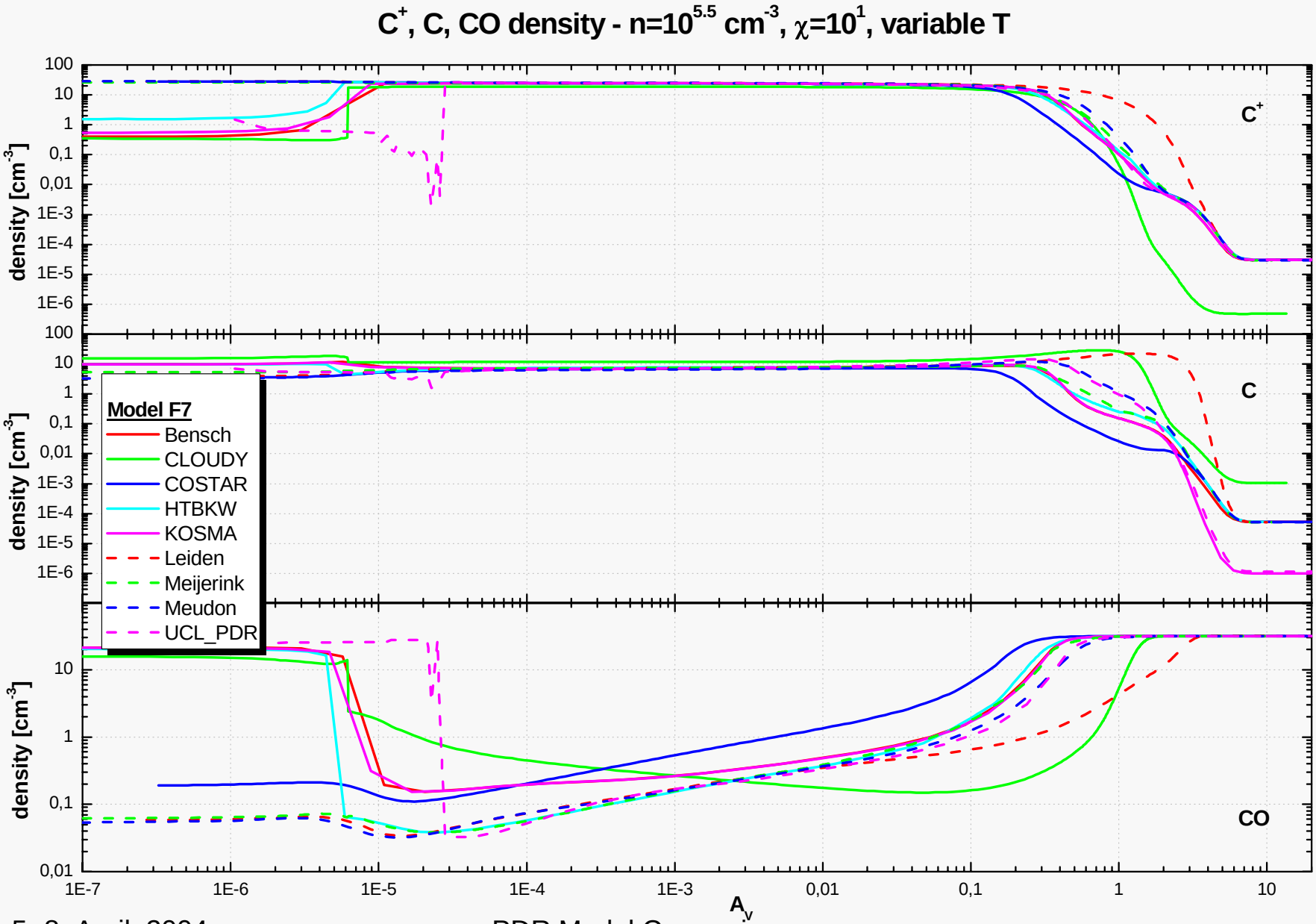

C+, C, CO density - n=10^3 cm^-3, χ=10^5, variable T
density [cm^-3]
C+
C
CO
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-3
0,01
0,1
1
10
A_v

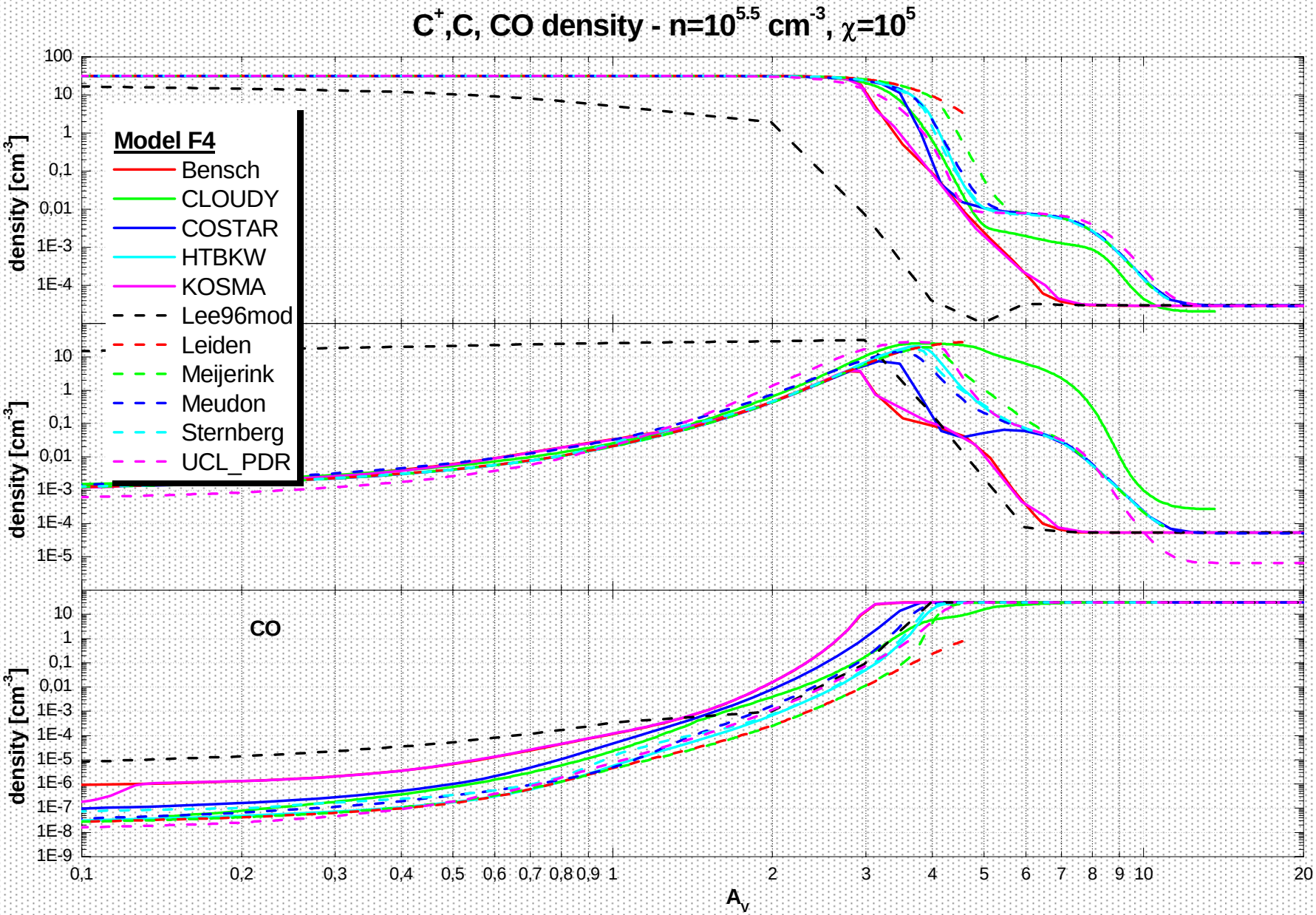

C+, C, CO density - n=10^3 cm^-3, χ=10^5, variable T
density [cm^-3]
C+
C
CO
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-3
0,01
0,1
1
10
A_V

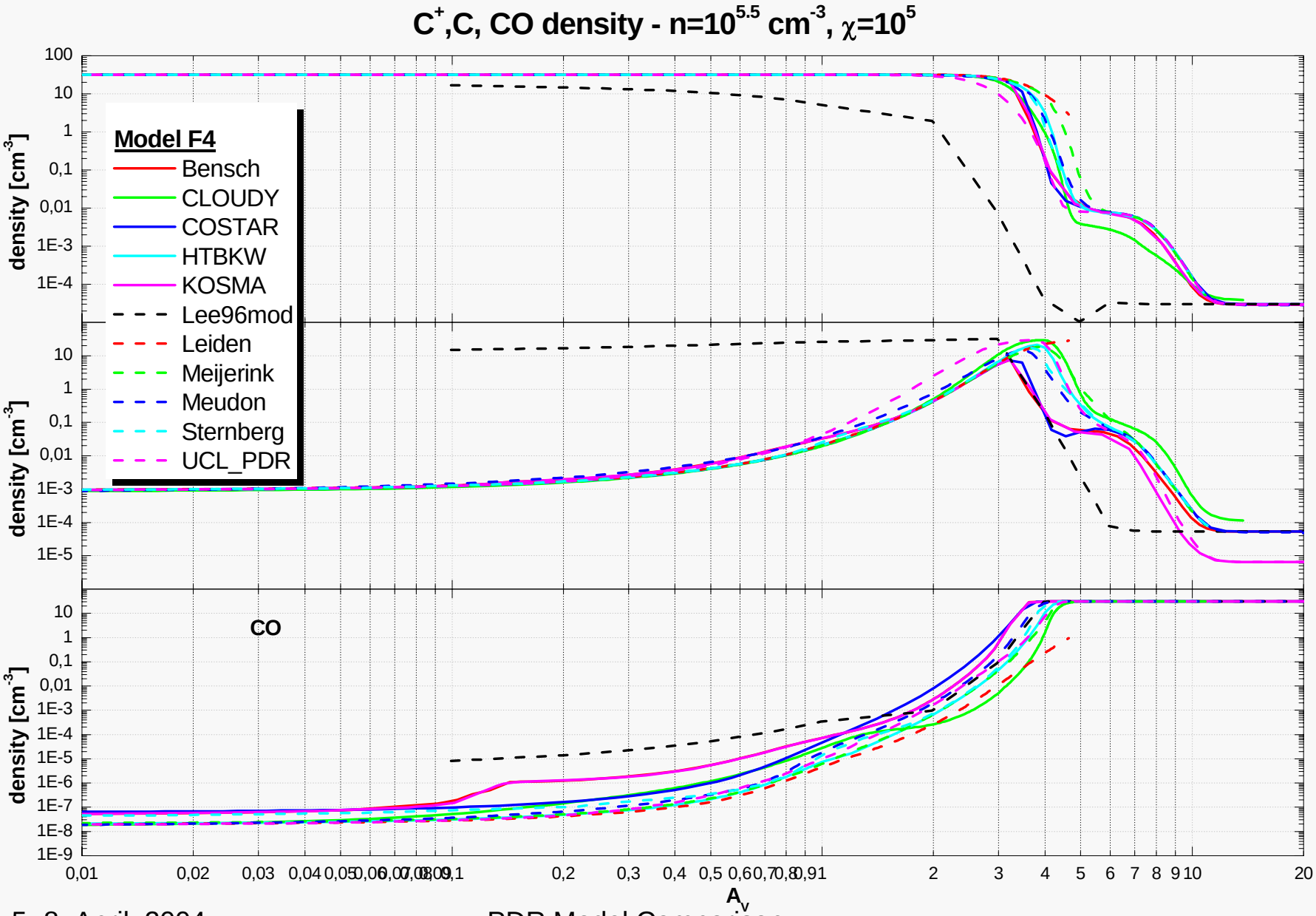

C+, C, CO density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
C+
C
CO
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

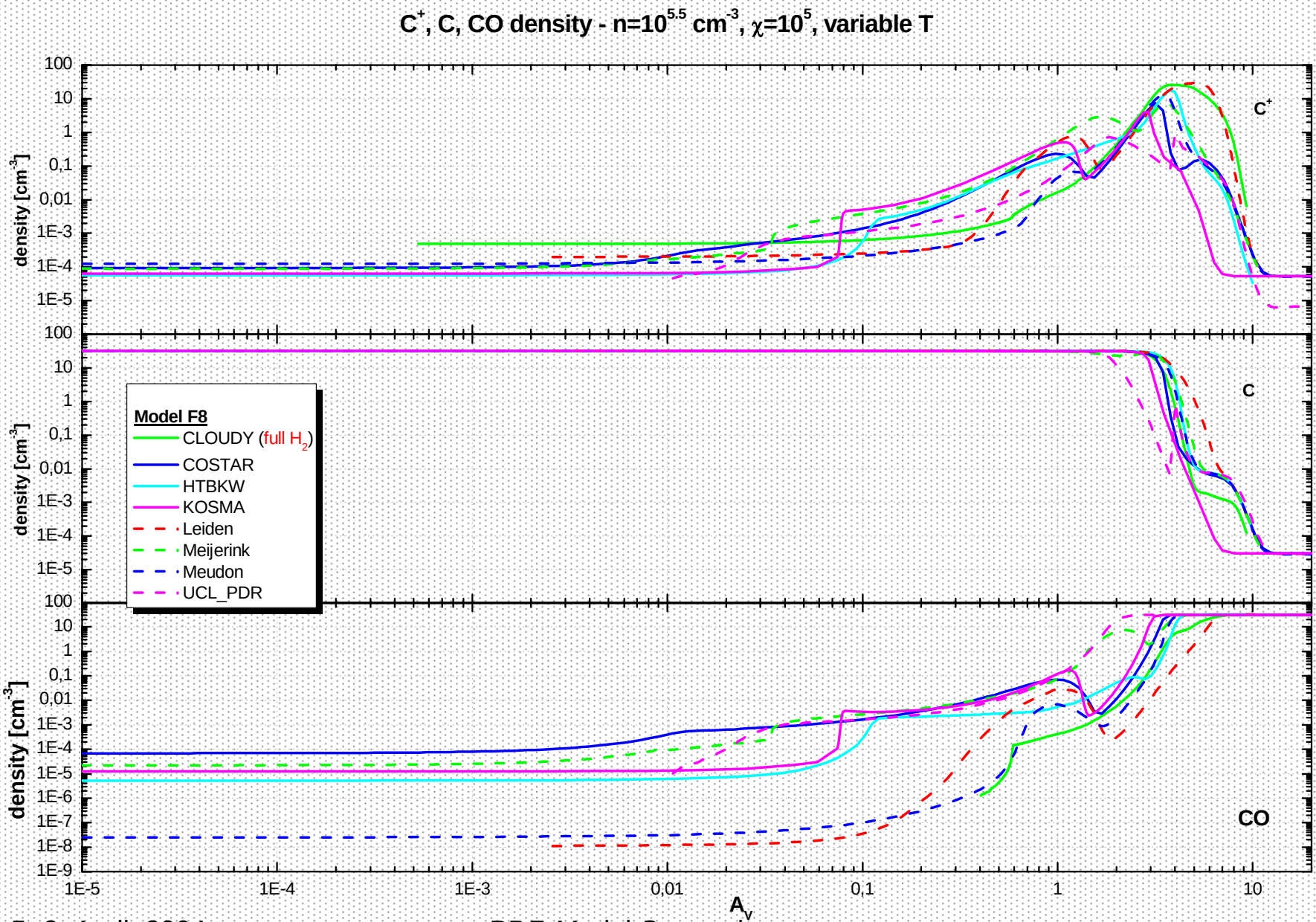

C+, C, CO density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
C+
C
CO
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
0,01
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

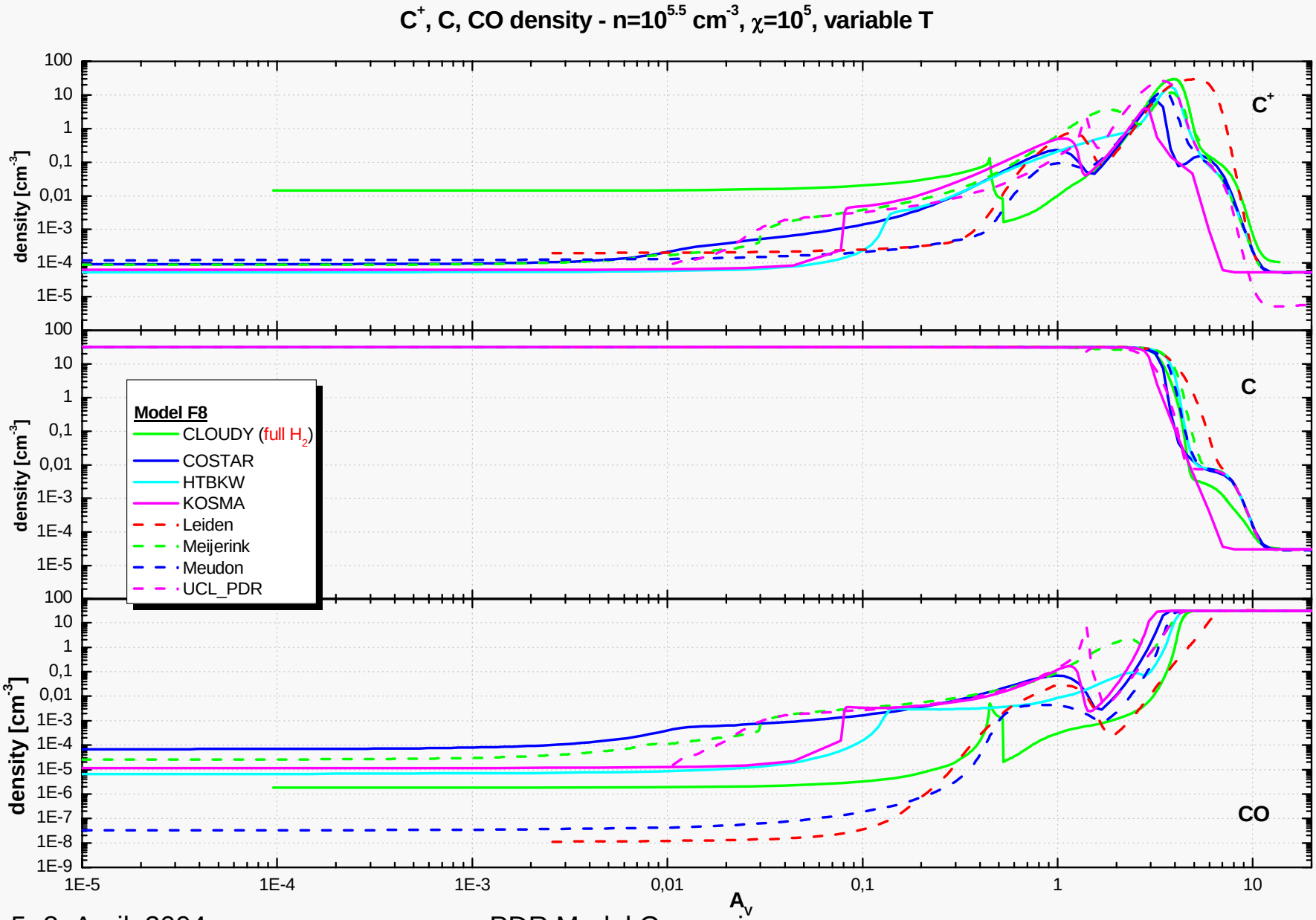

C+, C, CO density - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm^-3]
Model F7
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
C+
C
CO
A_V
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-5
1E-4
1E-3
0,01
0,1
1
10


C+, C, CO density - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm^-3]
C+
C
CO
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
0,01
0,1
1
10
A_V

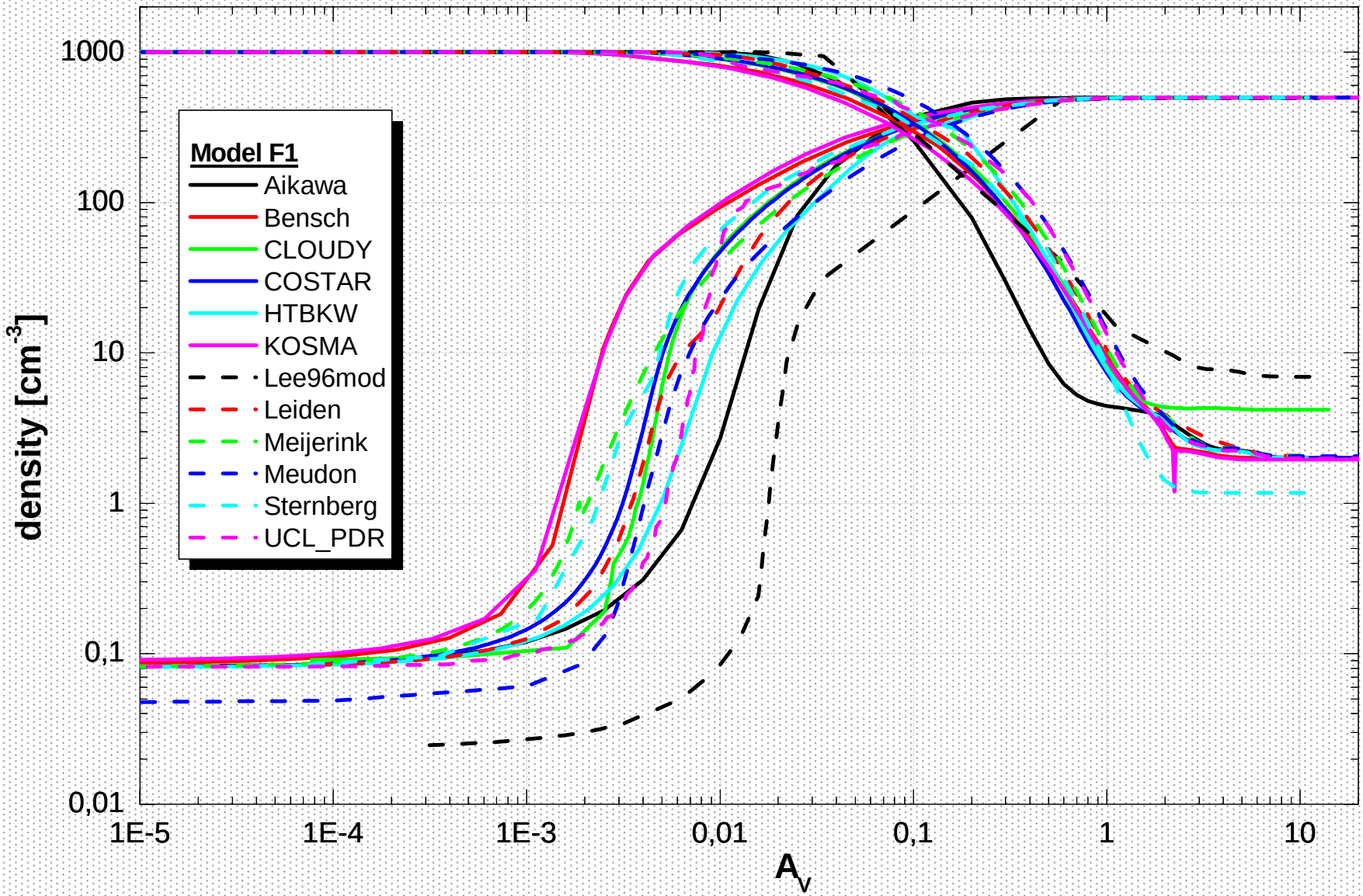

C+,C, CO density - n=10^5.5 cm^-3, χ=10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
CO
density [cm^-3]
A_V

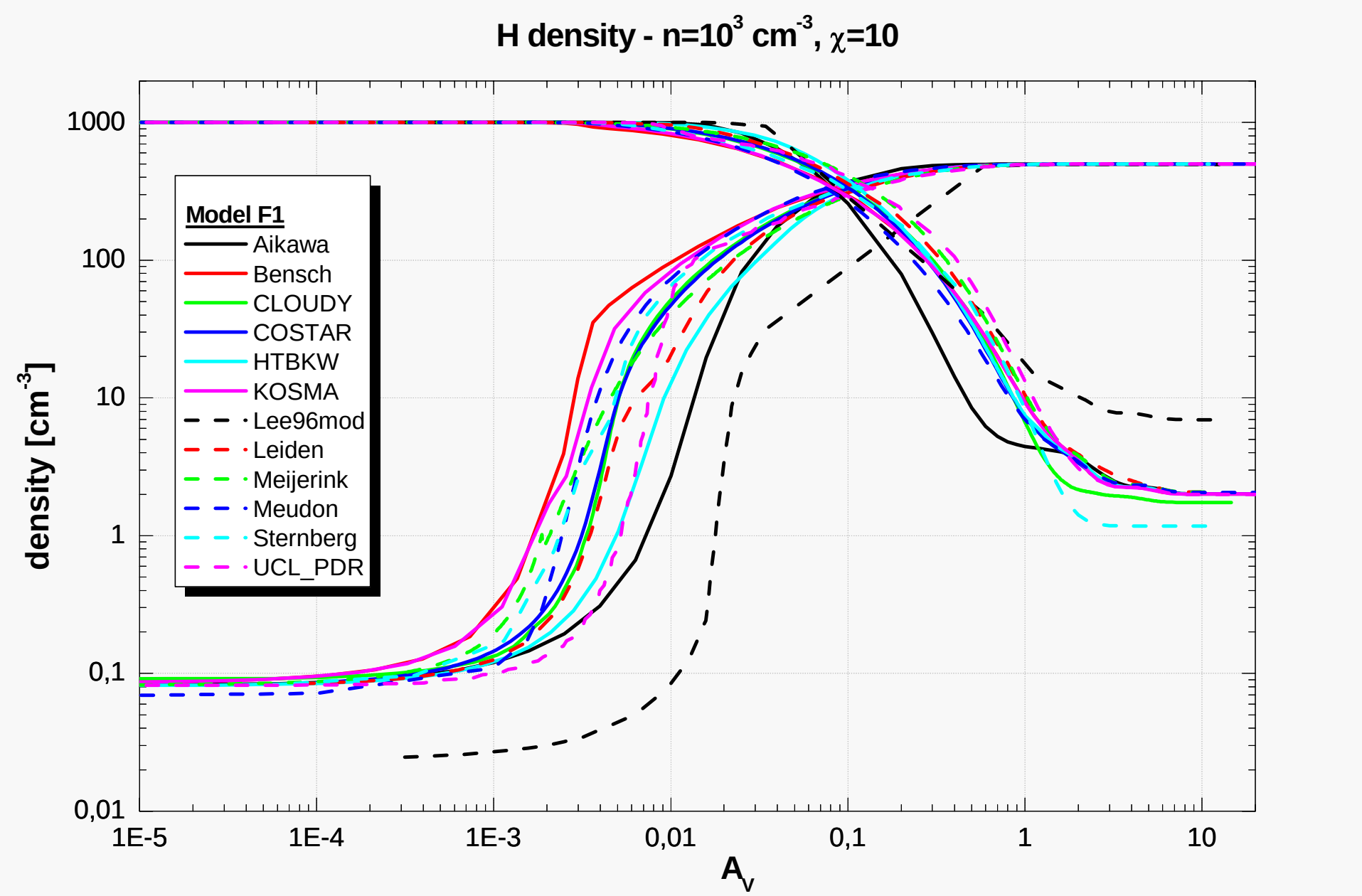

C+,C, CO density - n=10^5.5 cm^-3, χ=10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
CO
density [cm^-3]
A_V

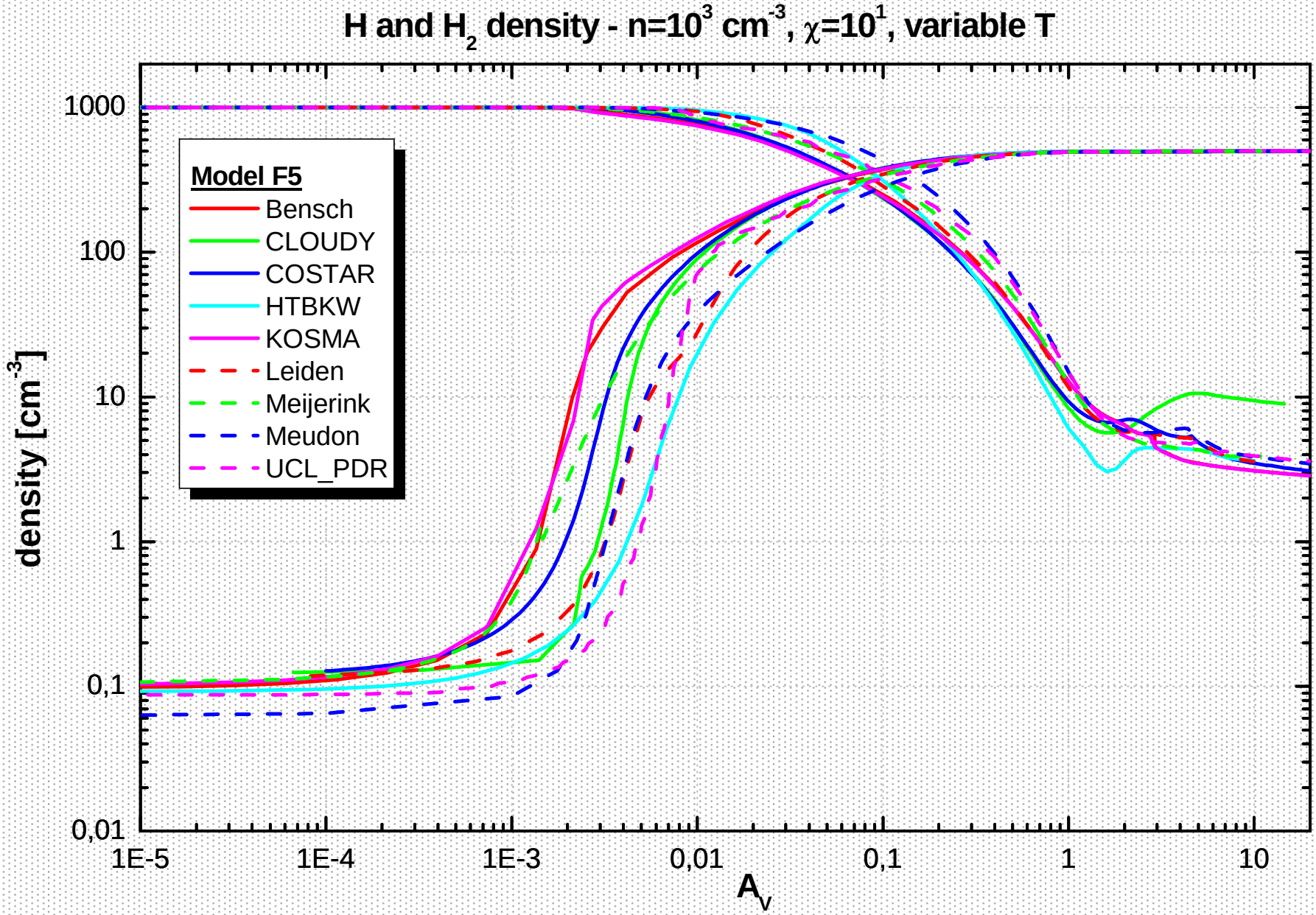

C+, C, CO density - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm^-3]
C+
C
CO
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV

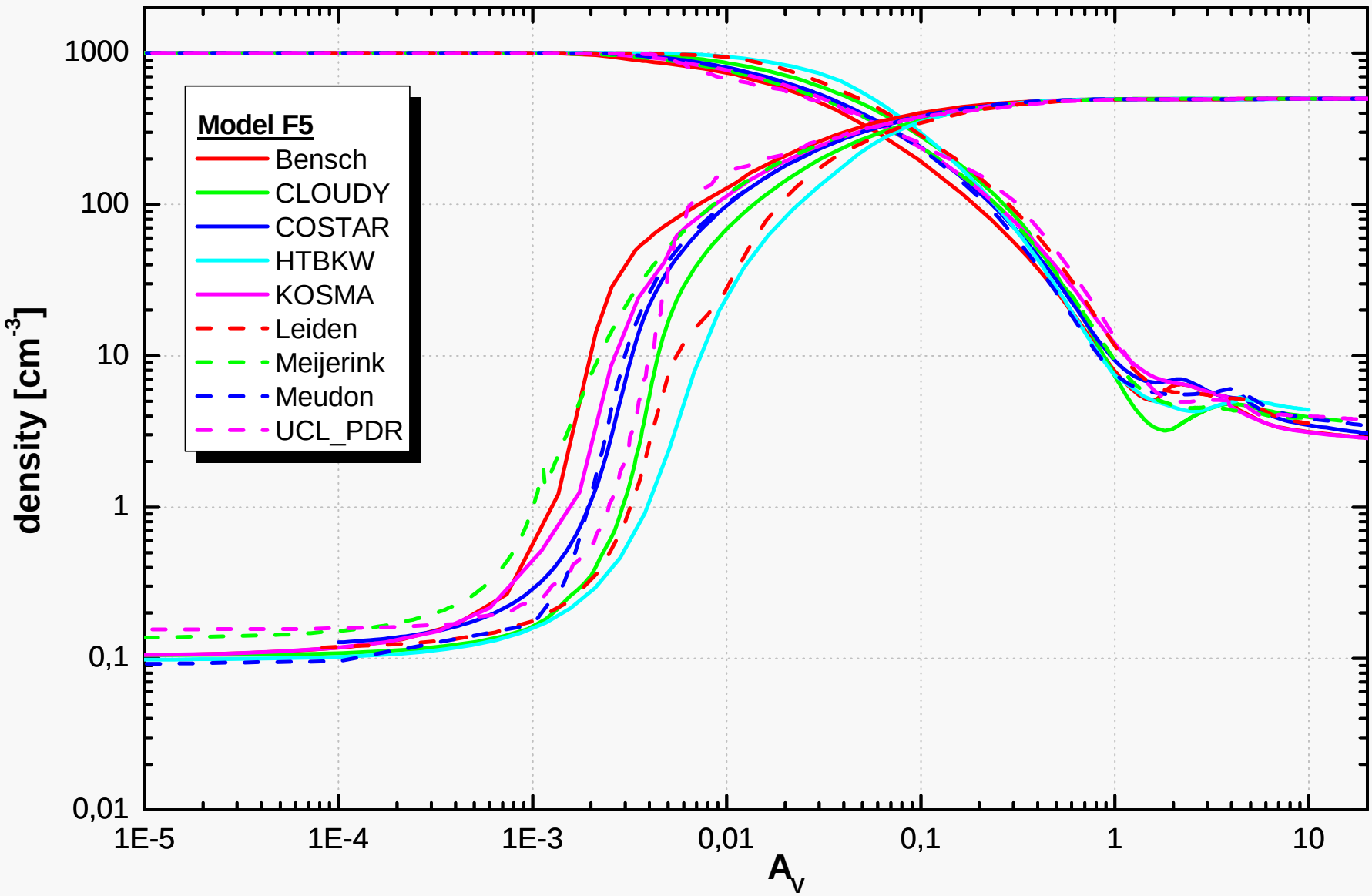

C+, C, CO density - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm^-3]
C+
C
CO
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV

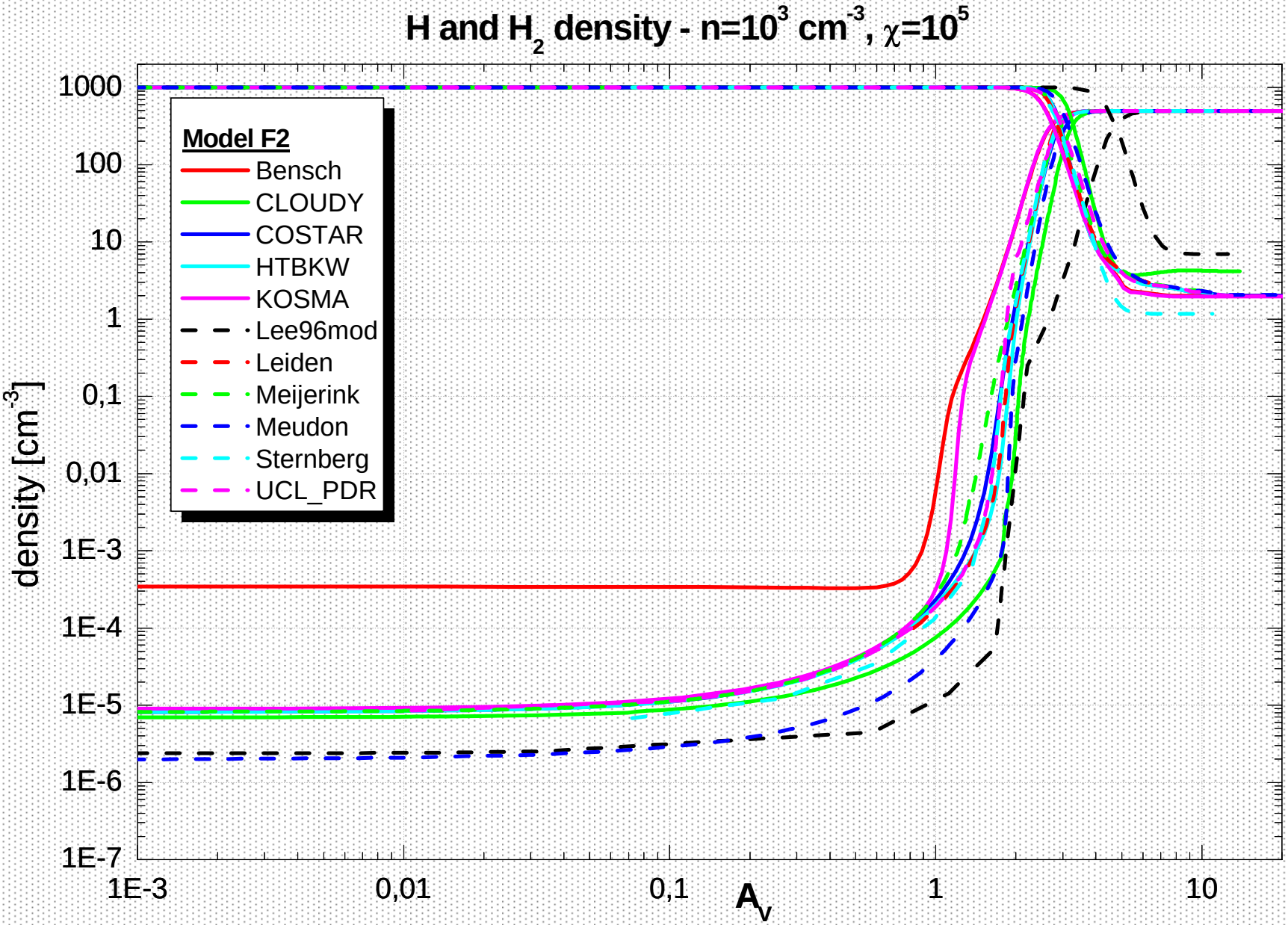
H and H_2 density

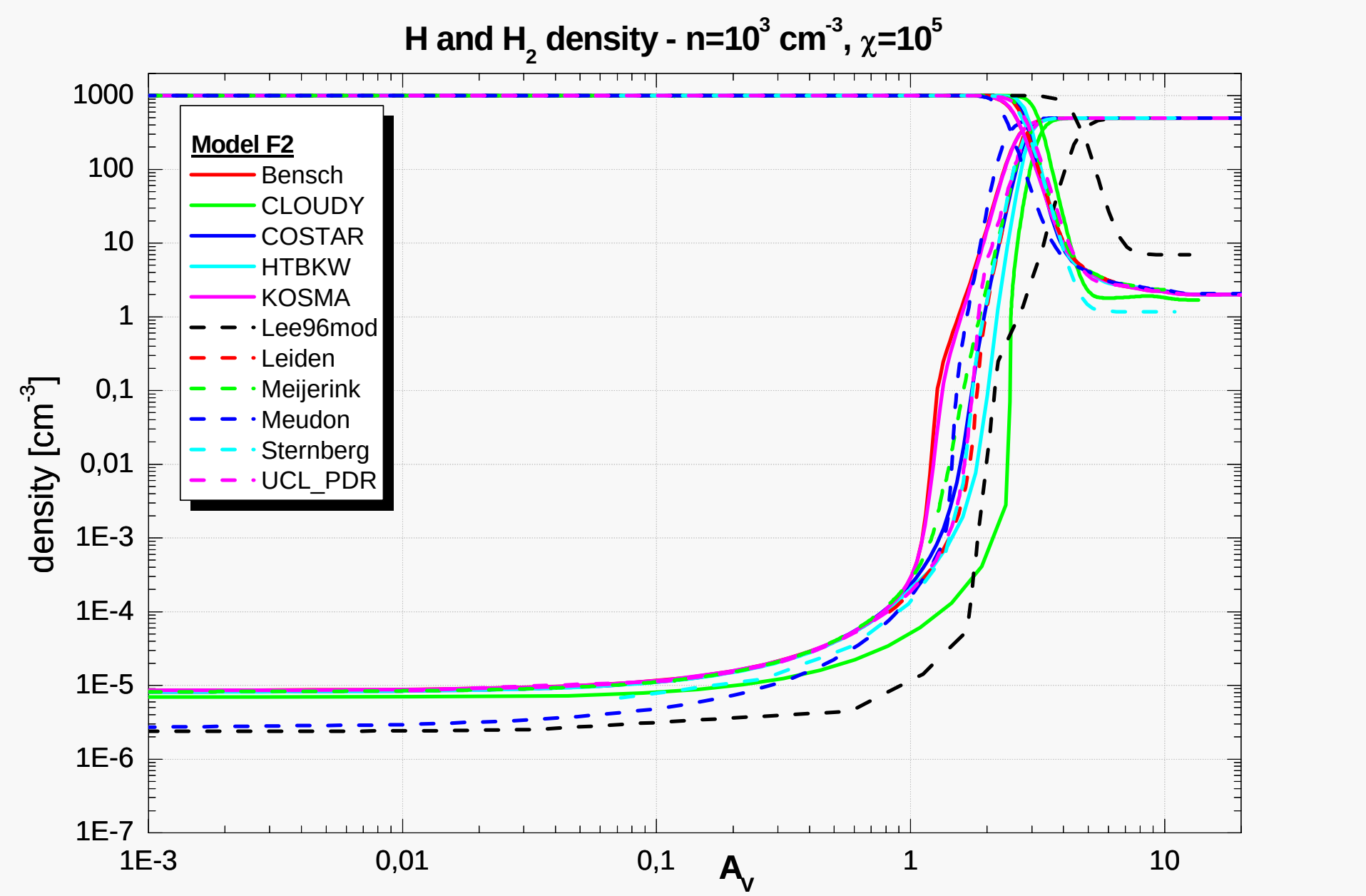

H density - n=10^3 cm^-3, χ=10
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

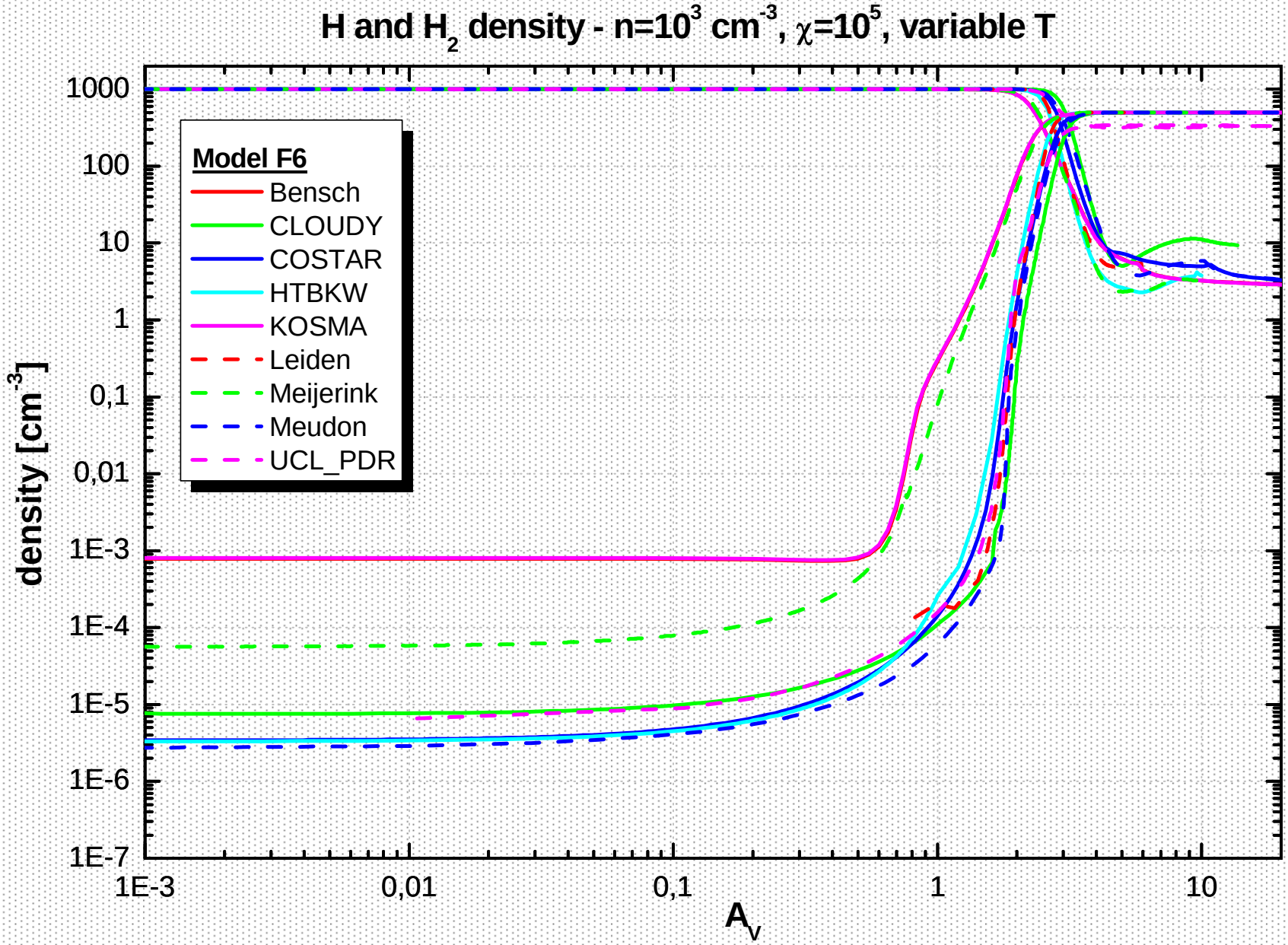

H density - n=10^3 cm^-3, χ=10
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

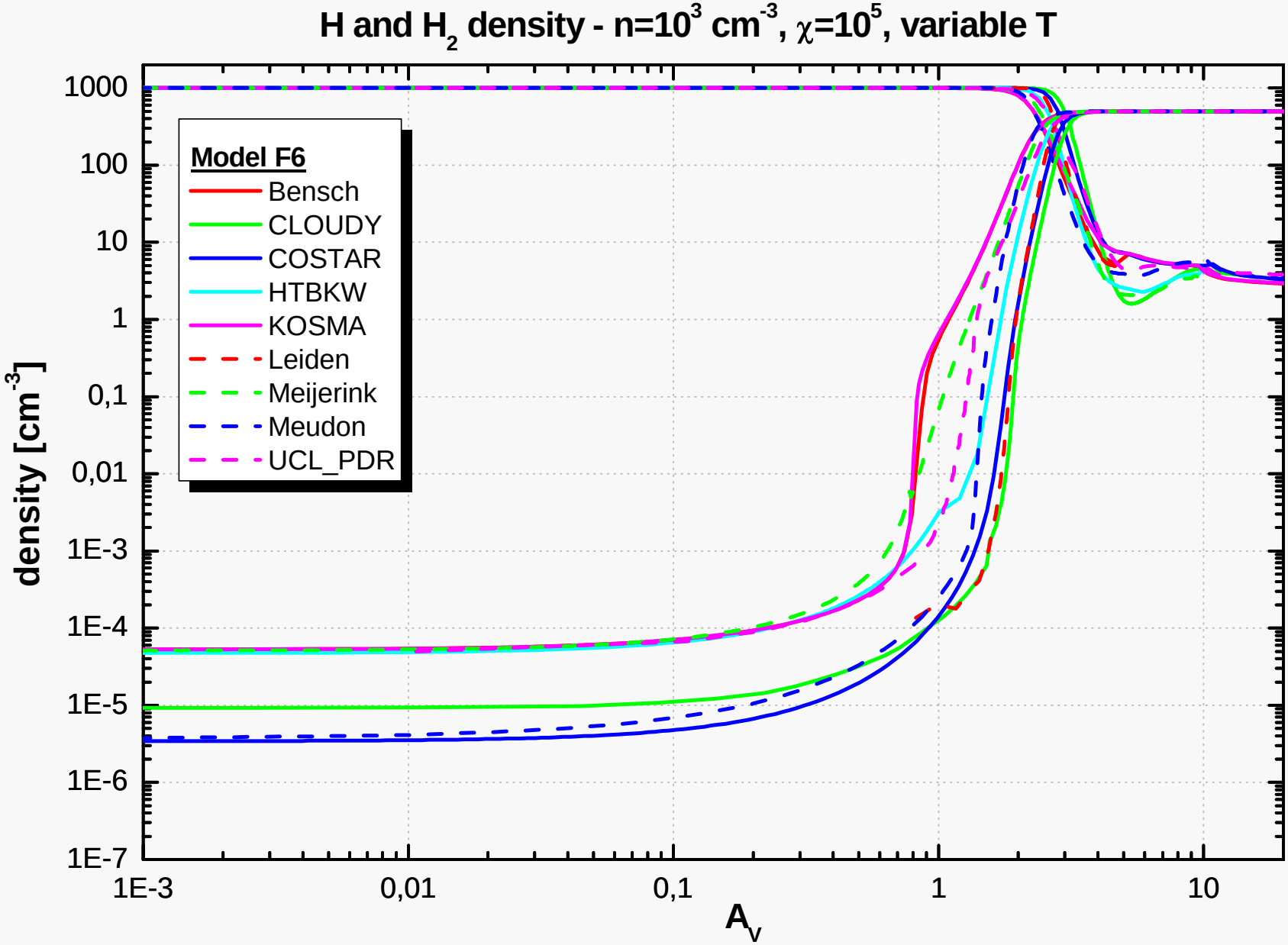

H and H2 density - n=10^3 cm^-3, χ=10^1, variable T
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

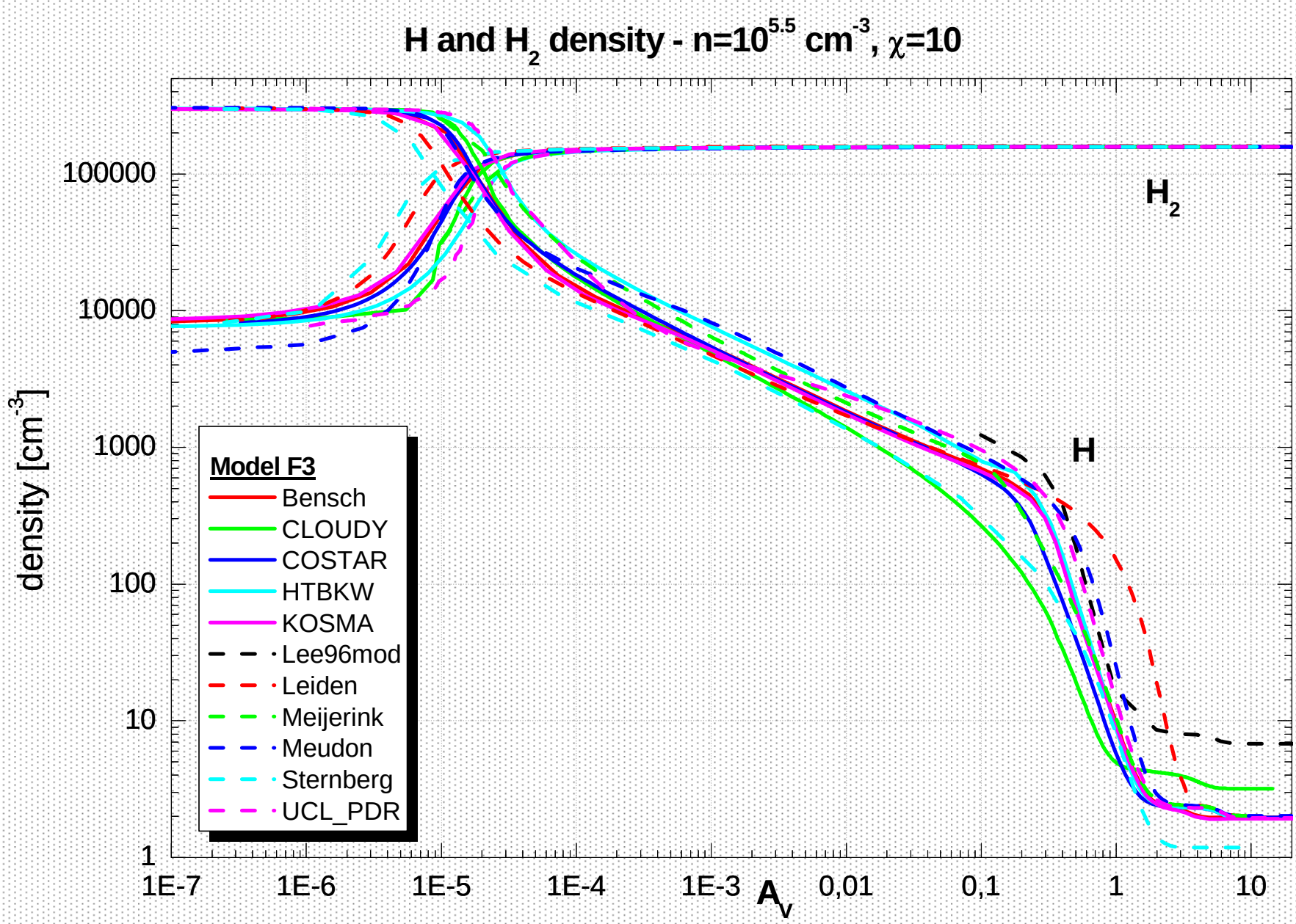

H and H2 density - n=10^3 cm^-3, χ=10^1, variable T
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

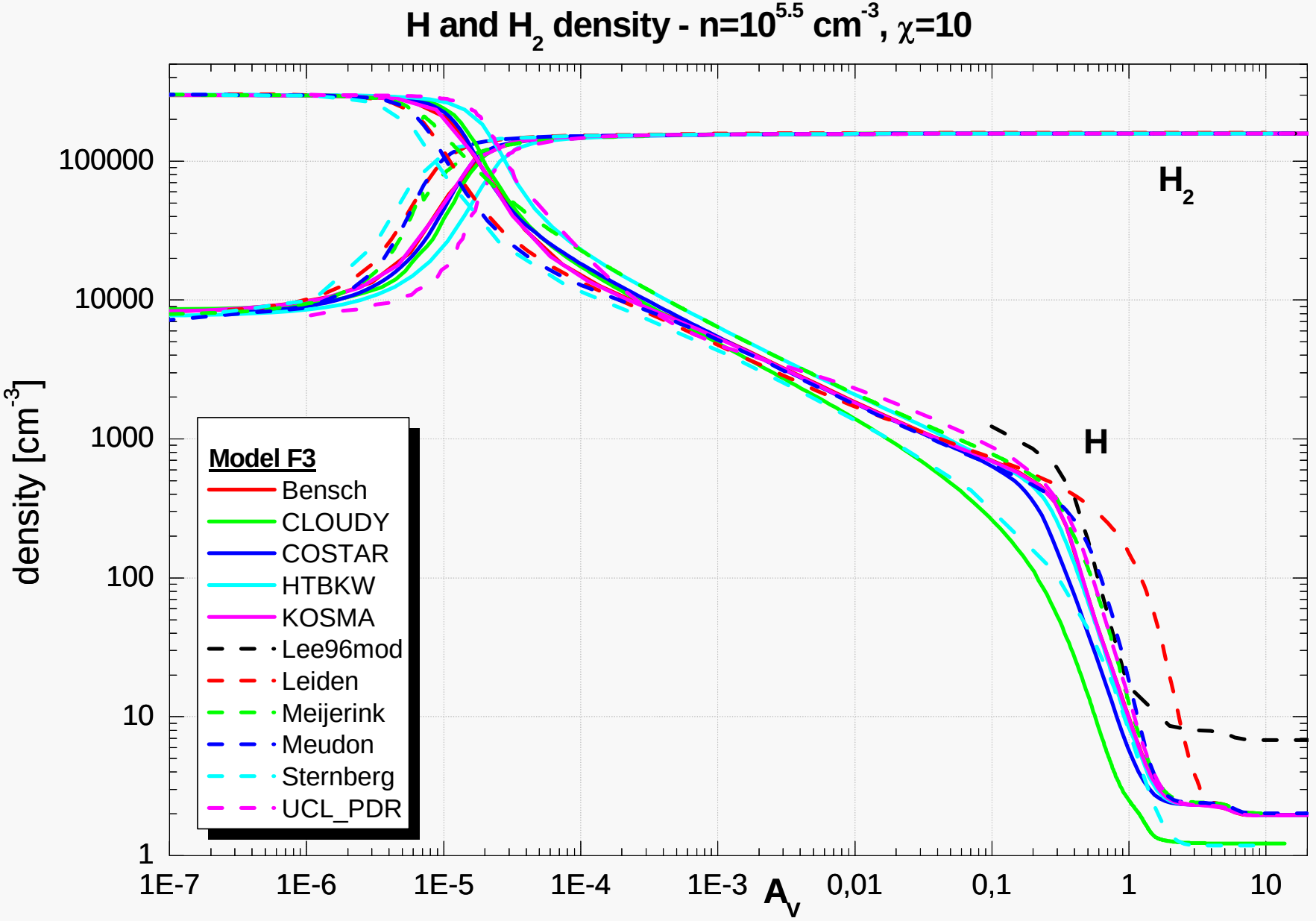

H and H2 density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-3
0,01
0,1
1
10
AV

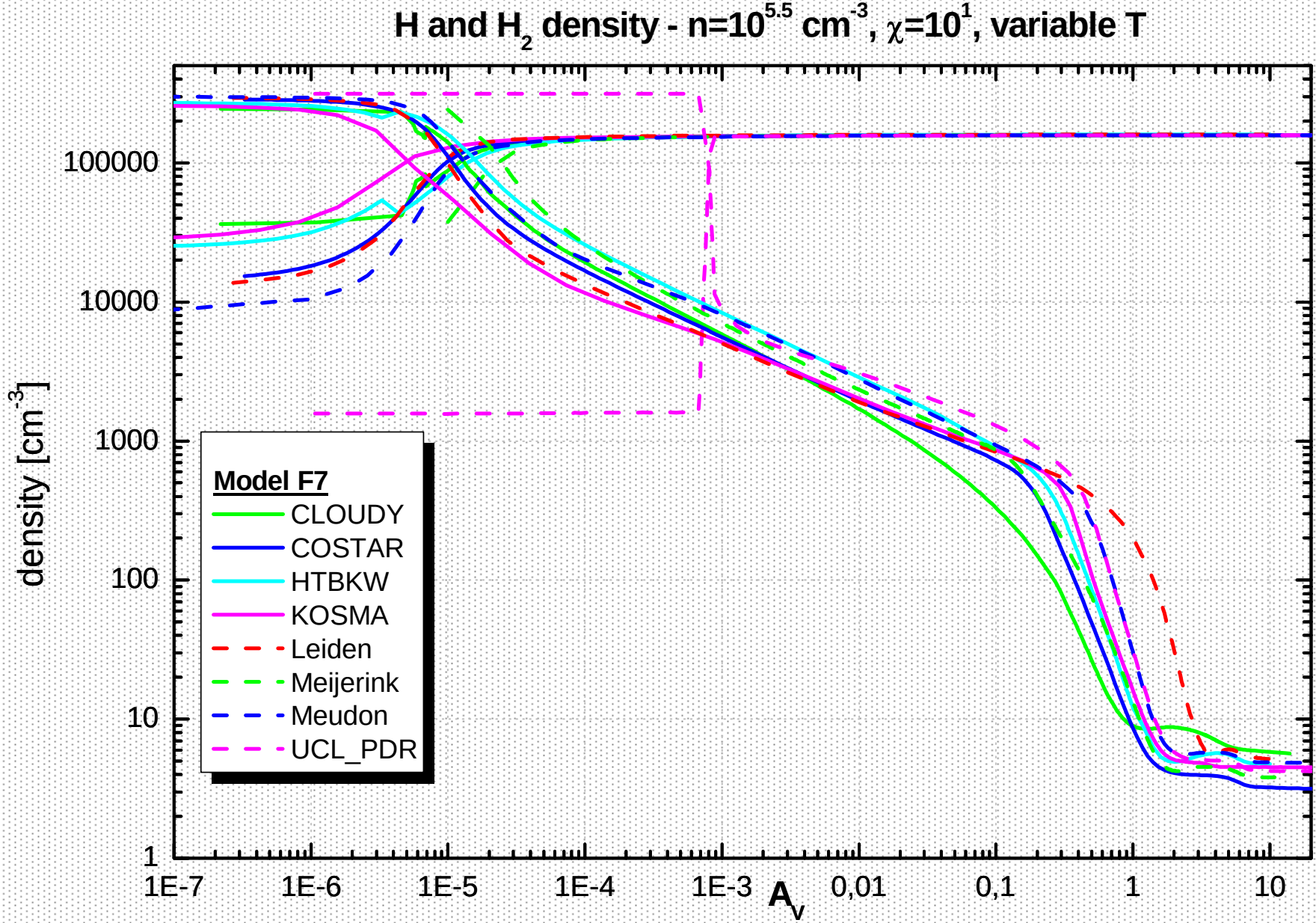

H and H2 density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-3
0,01
0,1
1
10
Av

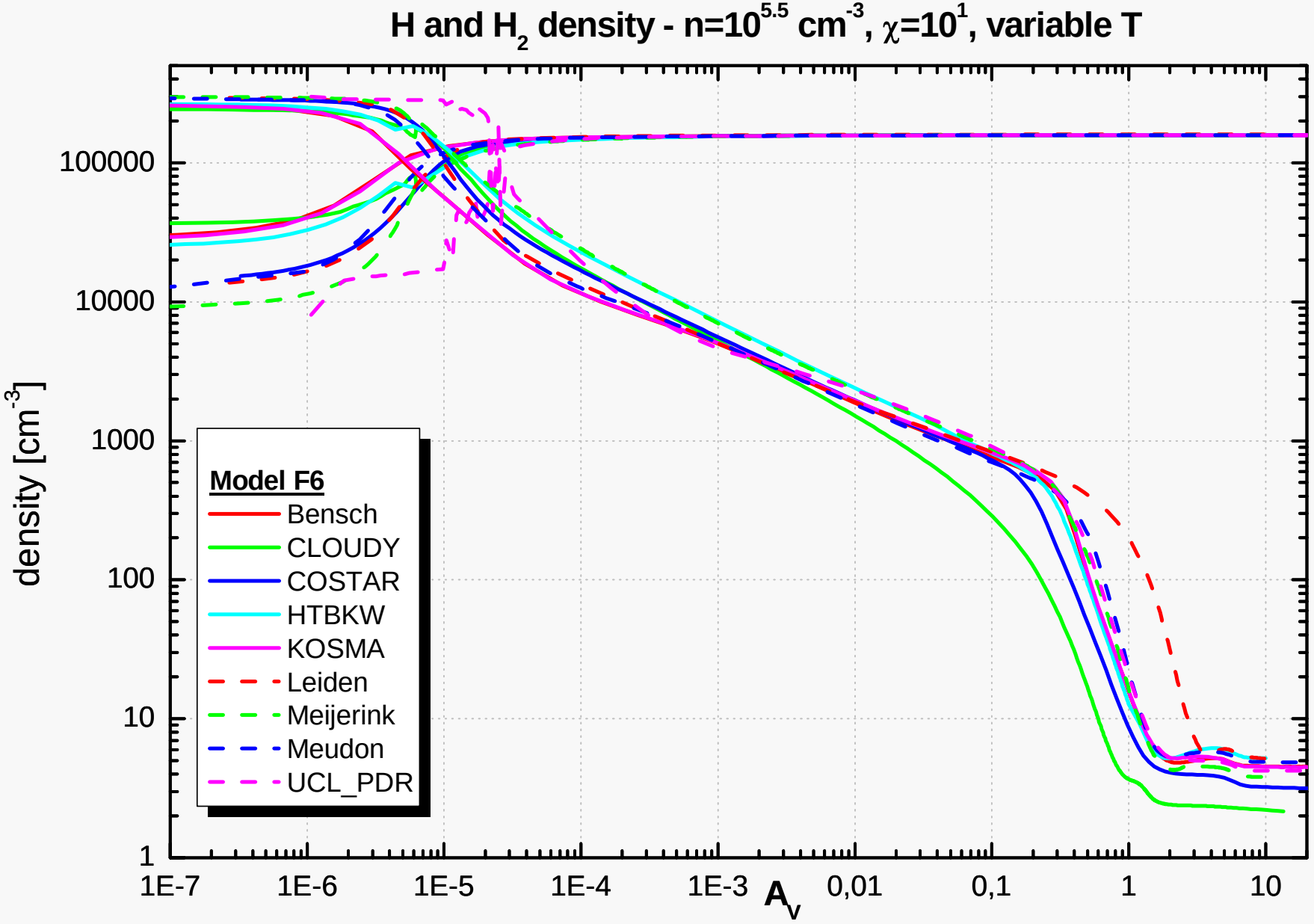

H and H2 density - n=10^3 cm^-3, χ=10^5, variable T
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-3
0,01
0,1
1
10
AV
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

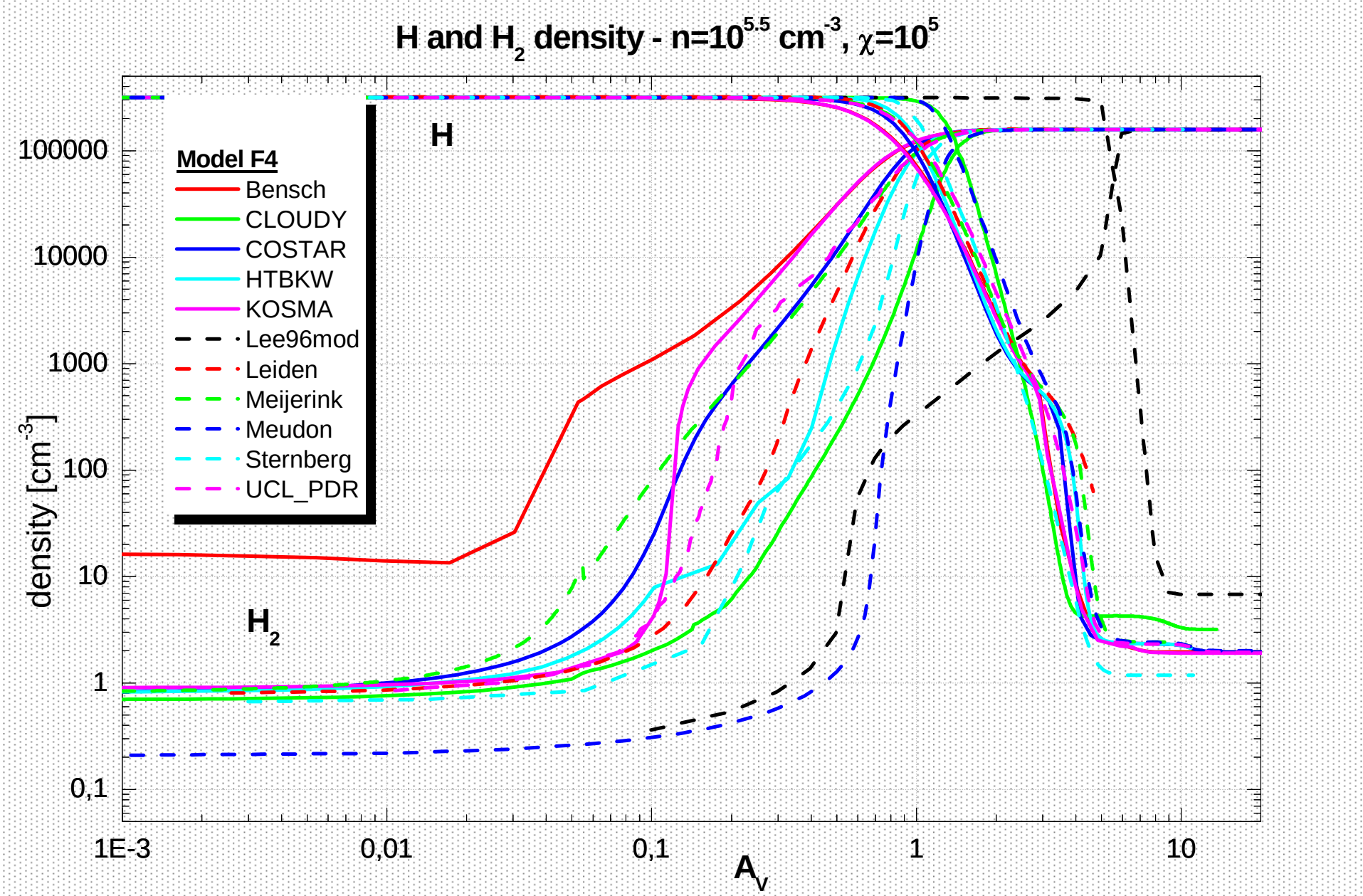

H and H2 density - n=10^3 cm^-3, χ=10^5, variable T
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
density [cm^-3]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-3
0,01
0,1
1
10
A_V

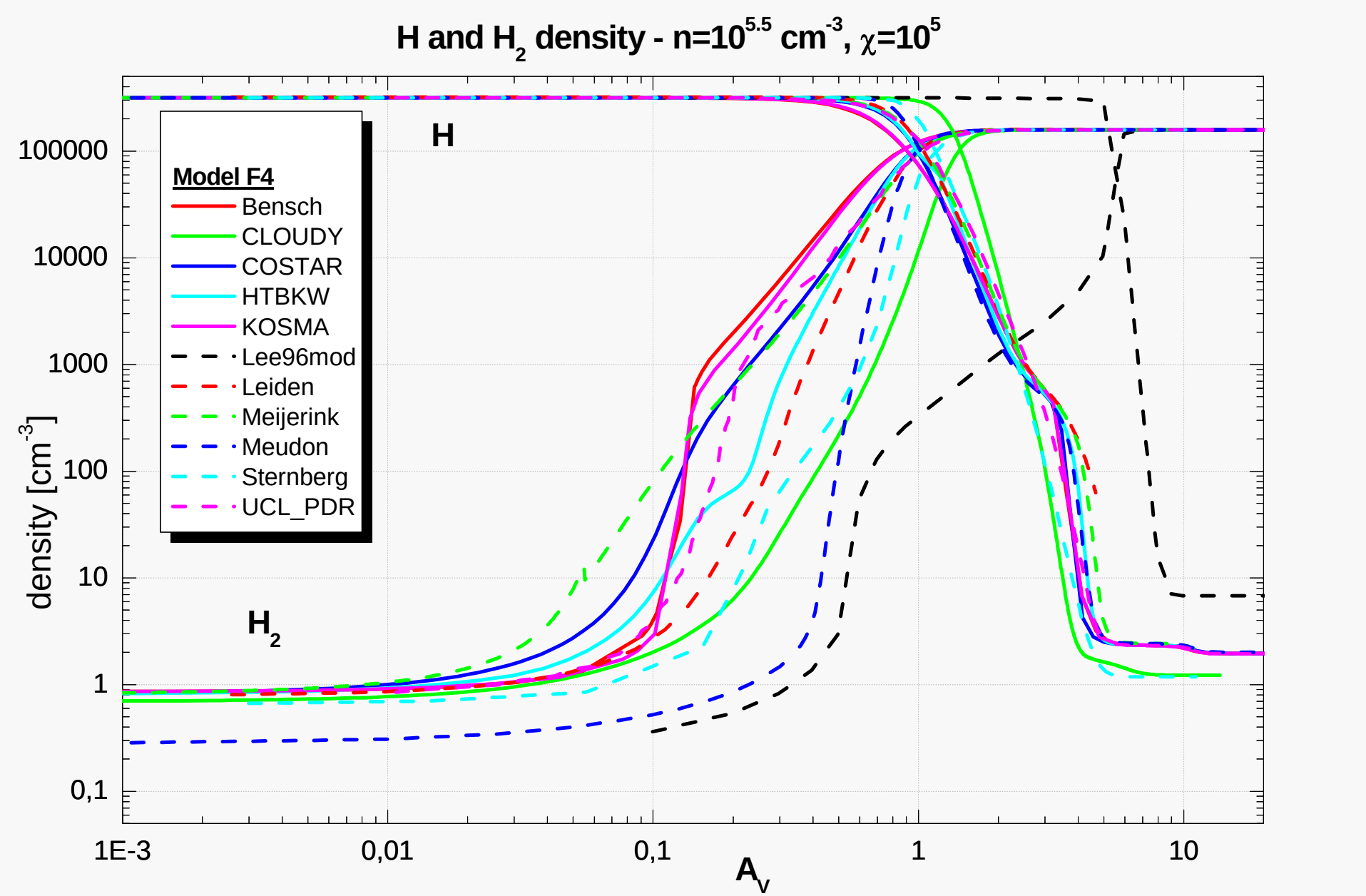

H and H2 density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
100000
10000
1000
100
10
1
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
Av
H2
H
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR

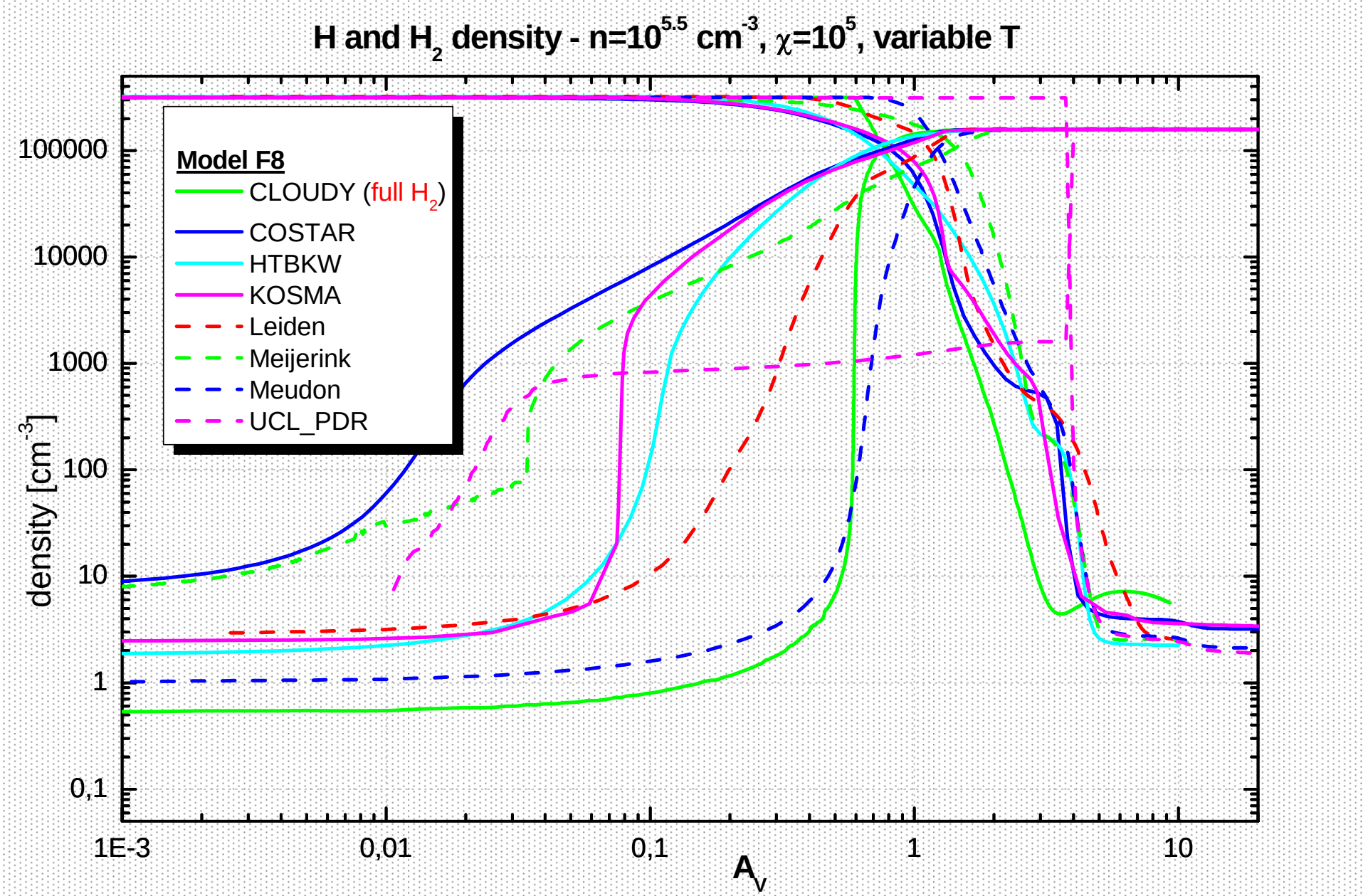

H and H2 density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
100000
10000
1000
100
10
1
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
Av
H2
H
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR

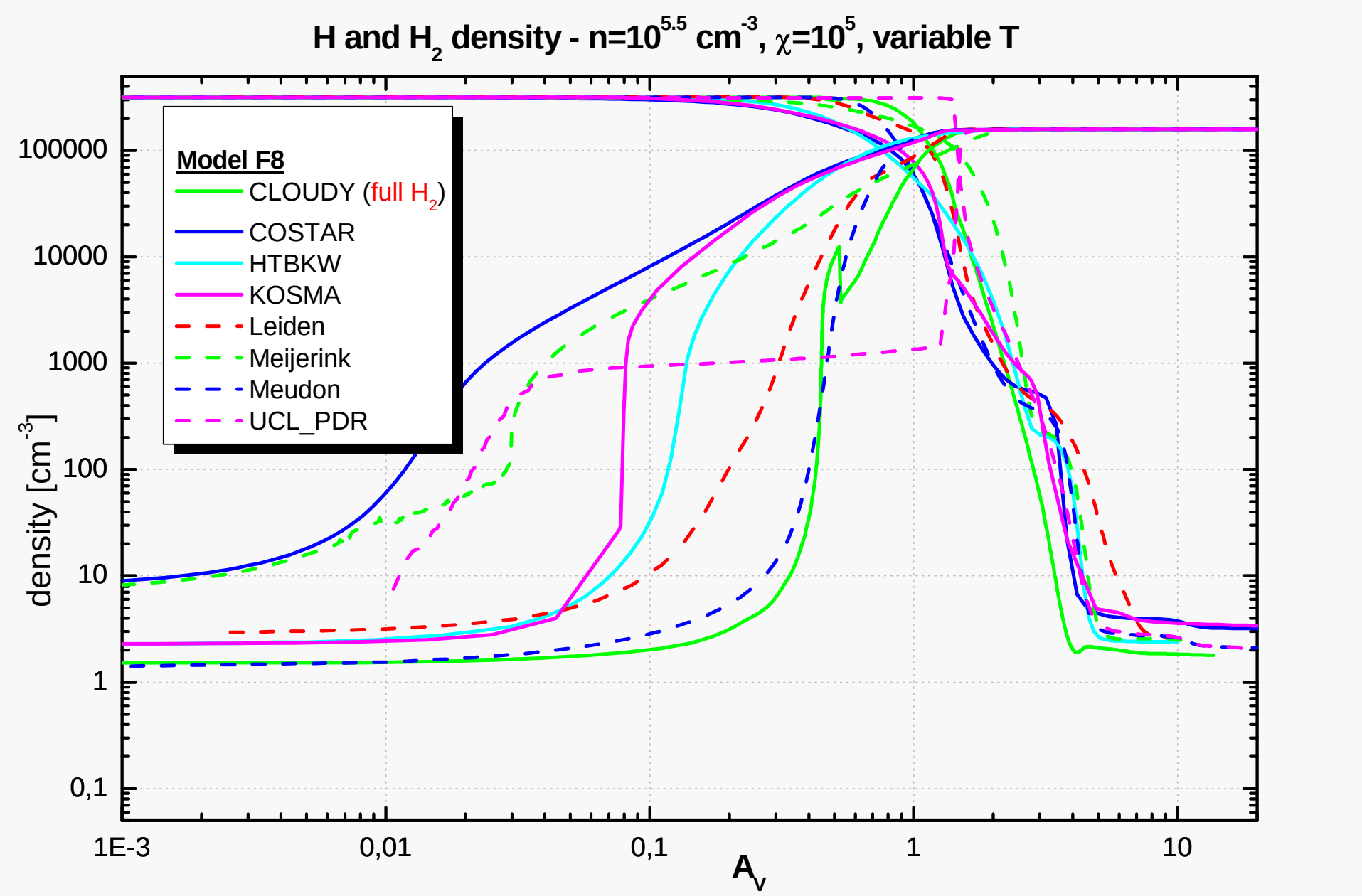

H and H2 density - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm^-3]
100000
10000
1000
100
10
1
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV
Model F7
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR


H and H2 density - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm^-3]
100000
10000
1000
100
10
1
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

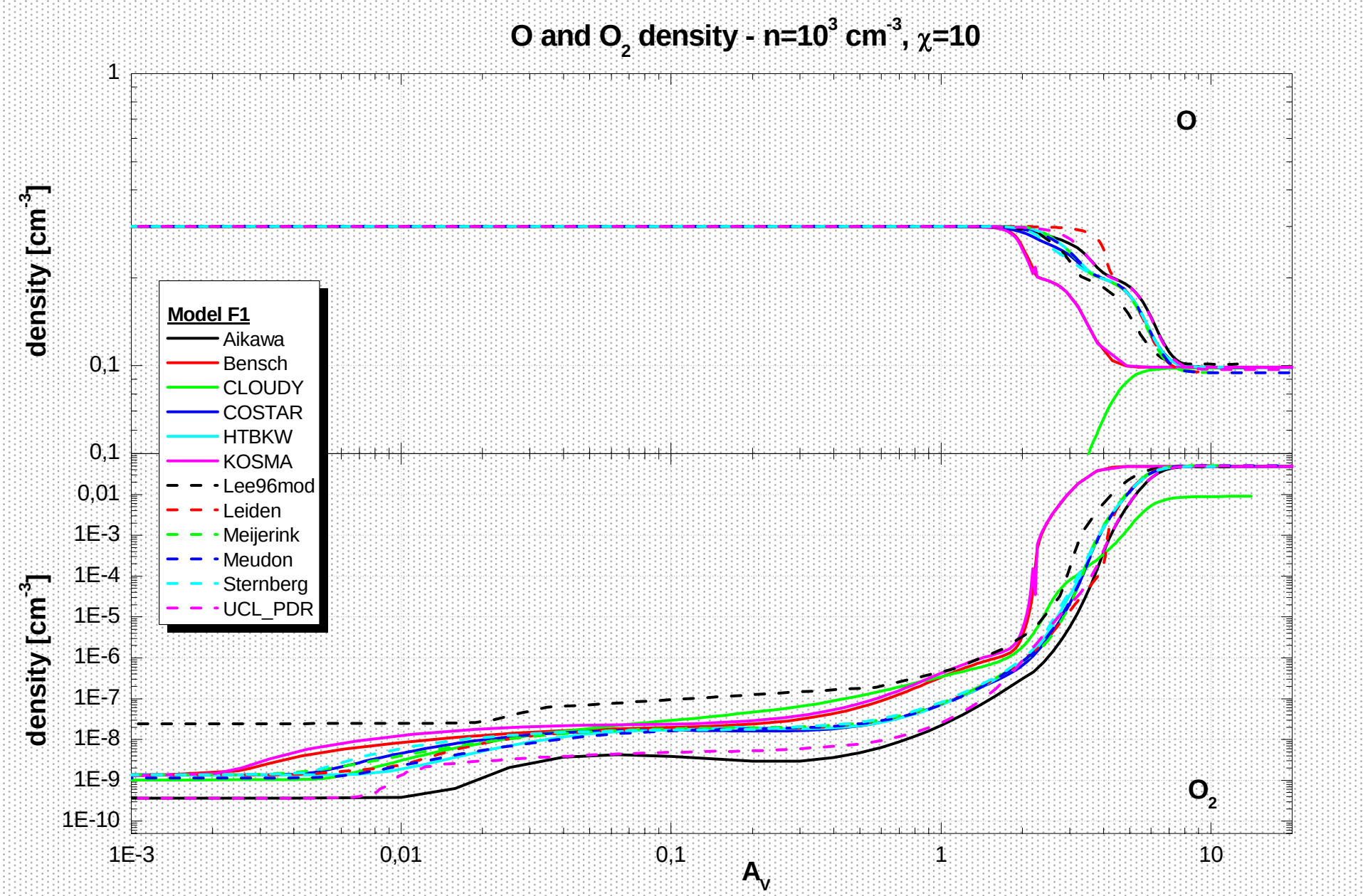

H and H2 density - n=10^5.5 cm^-3, χ=10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
H
H2
density [cm^-3]
100000
10000
1000
100
10
1
0,1
1E-3
0,01
0,1
1
10
Av

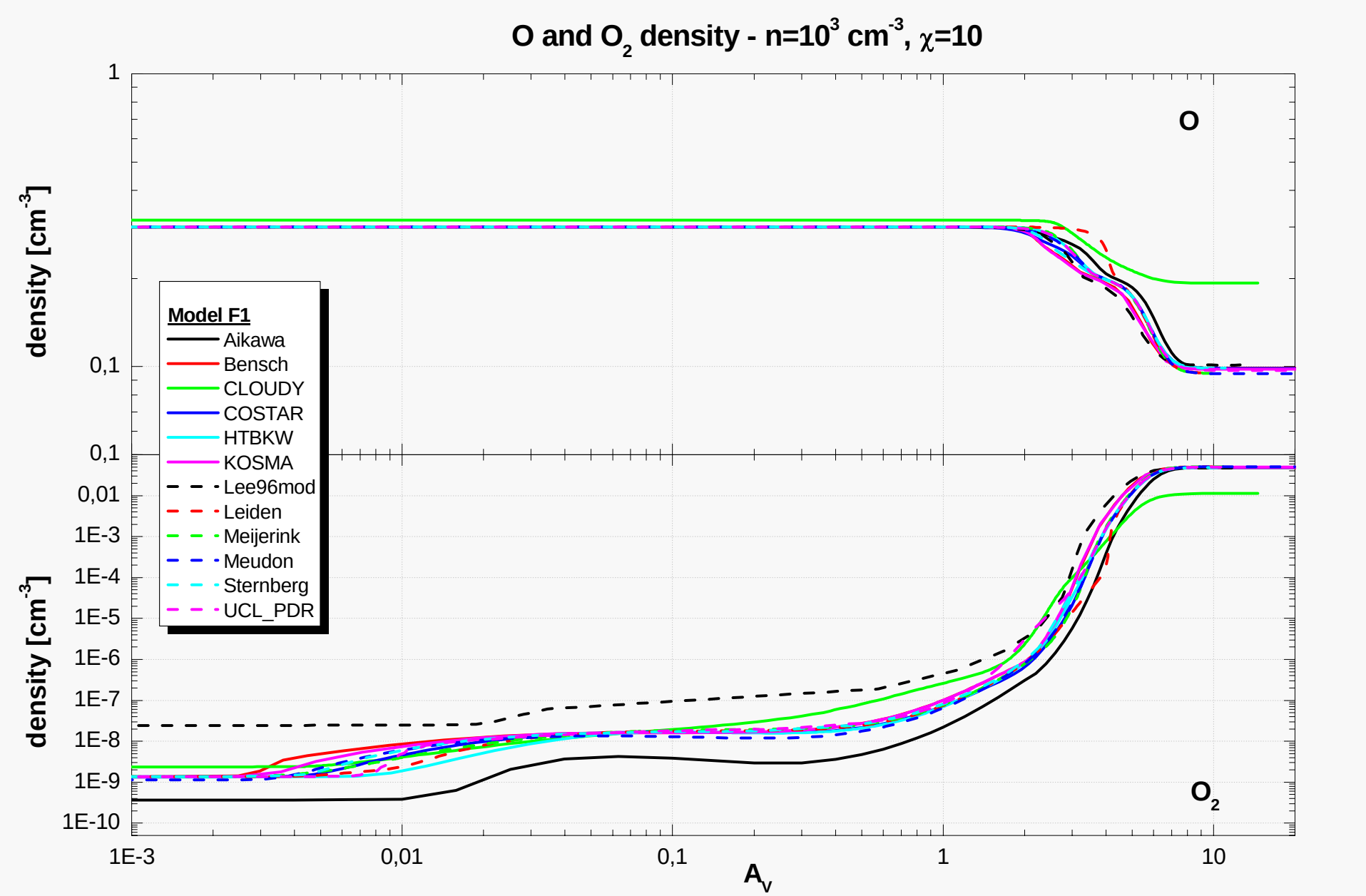

H and H2 density - n=10^5.5 cm^-3, χ=10^5
H
H2
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
100000
10000
1000
100
10
1
0,1
1E-3
0,01
0,1
1
10
AV

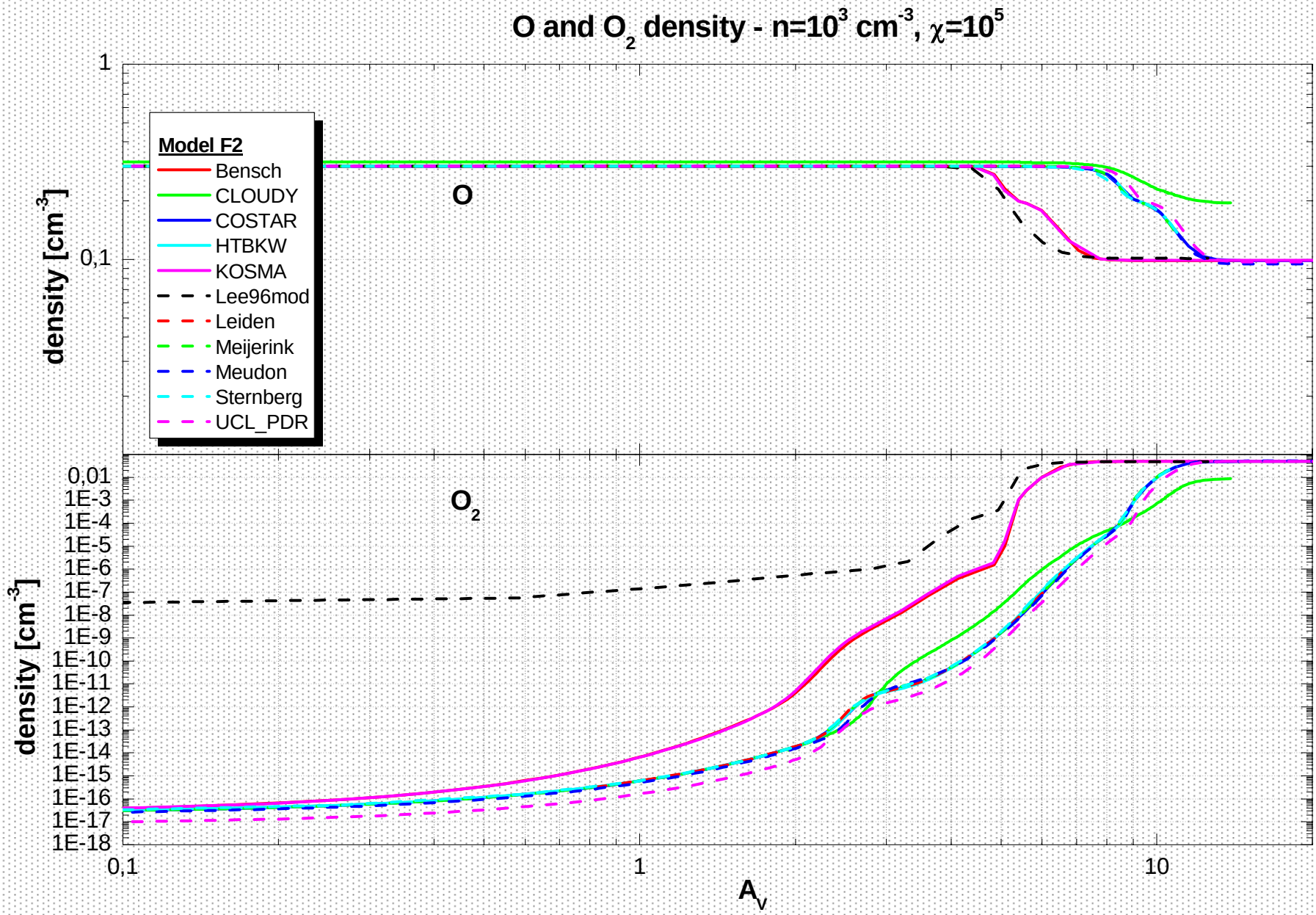

H and H2 density - n=10^5.5 cm^-3, χ=10^5, variable T
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
density [cm^-3]
100000
10000
1000
100
10
1
0,1
1E-3
0,01
0,1
1
10
Av

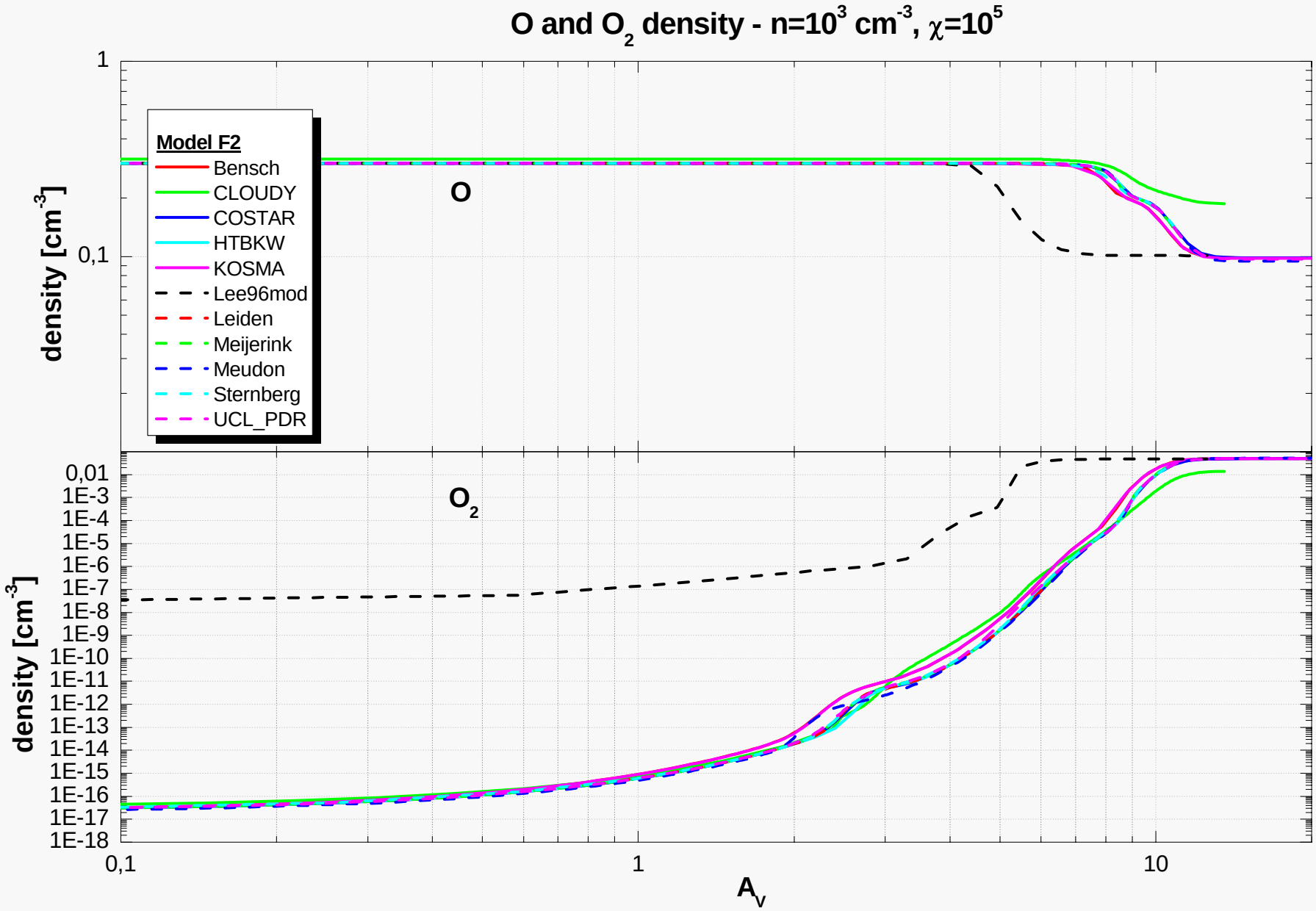

H and H2 density - n=10^5.5 cm^-3, χ=10^5, variable T
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
density [cm^-3]
100000
10000
1000
100
10
1
0,1
1E-3
0,01
0,1
1
10
Av

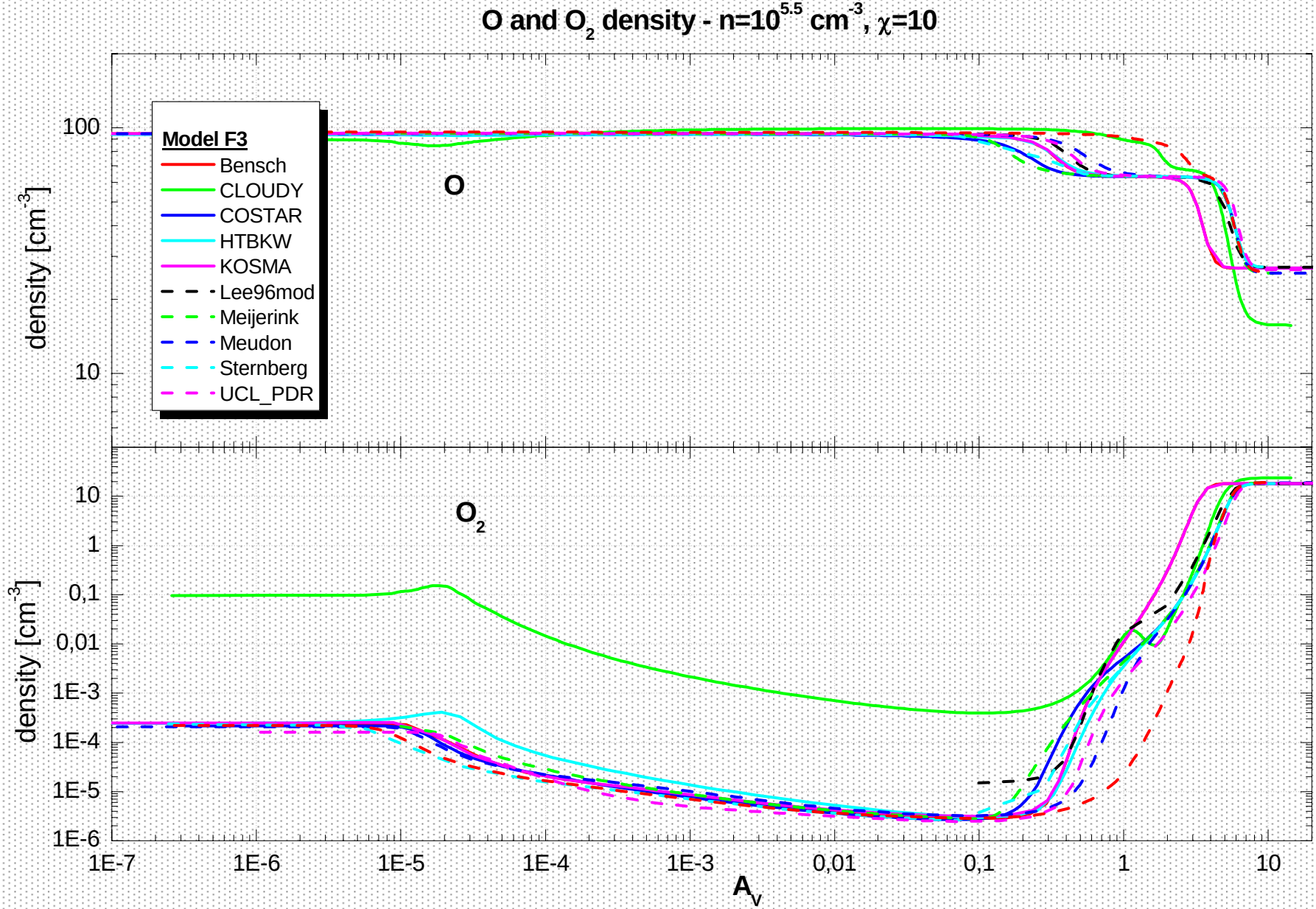
O and O_2 density

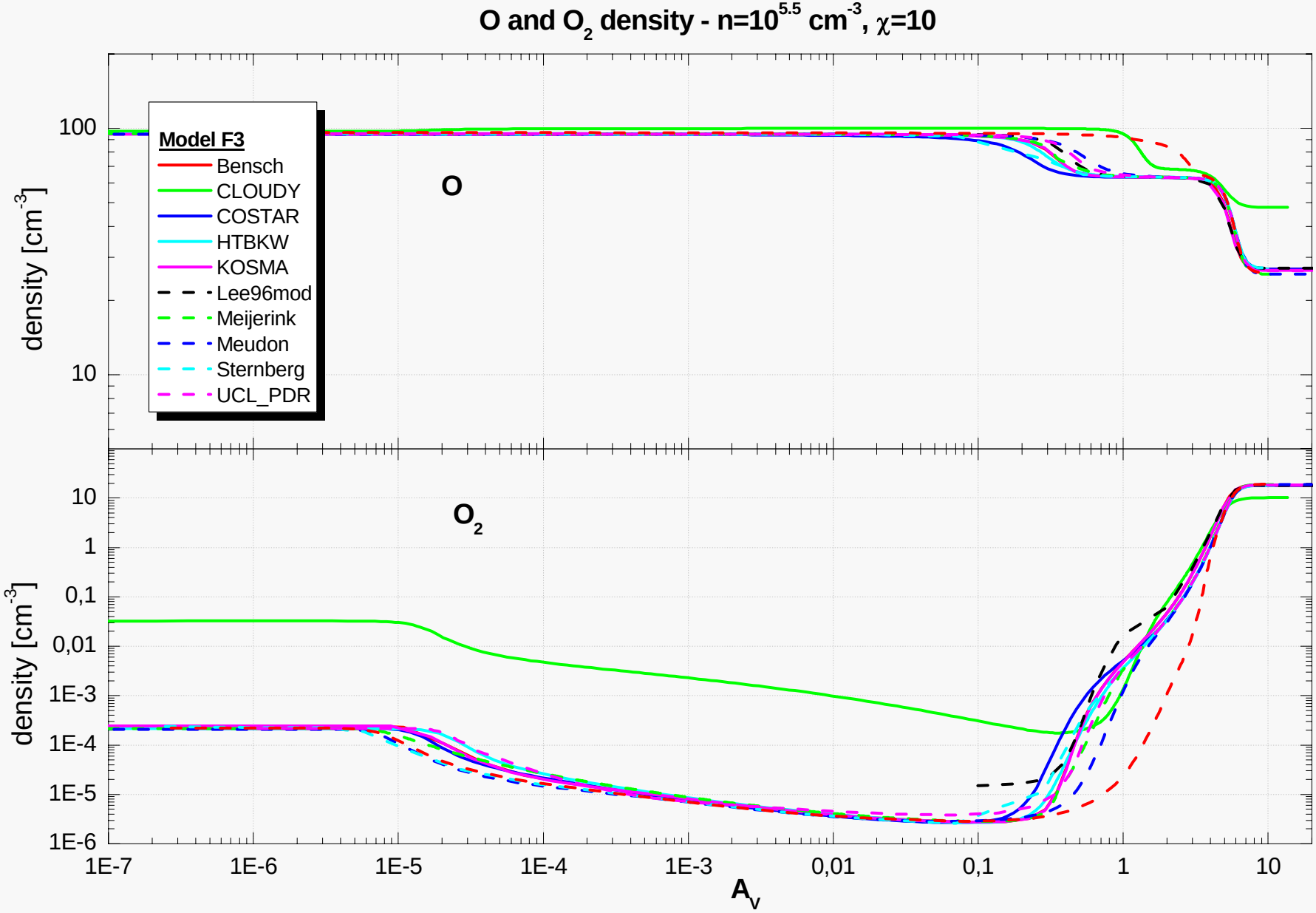

O and O2 density - n=10^3 cm^-3, χ=10
density [cm^-3]
O
O2
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1
0,1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-3
0,01
0,1
1
10
Av

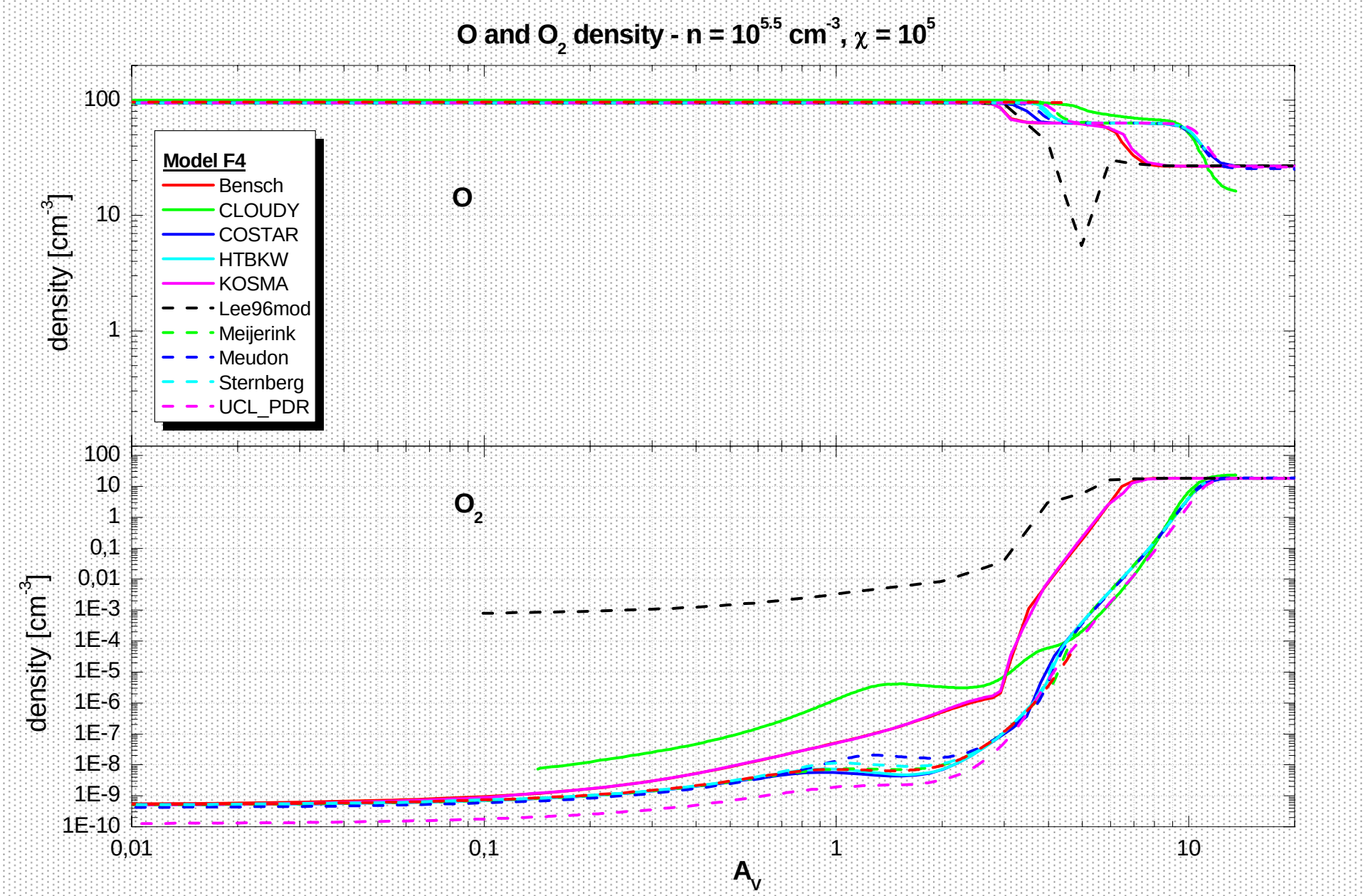

O and O2 density - n=10^3 cm^-3, χ=10
density [cm^-3]
O
O2
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-3
0,01
0,1
1
10
AV

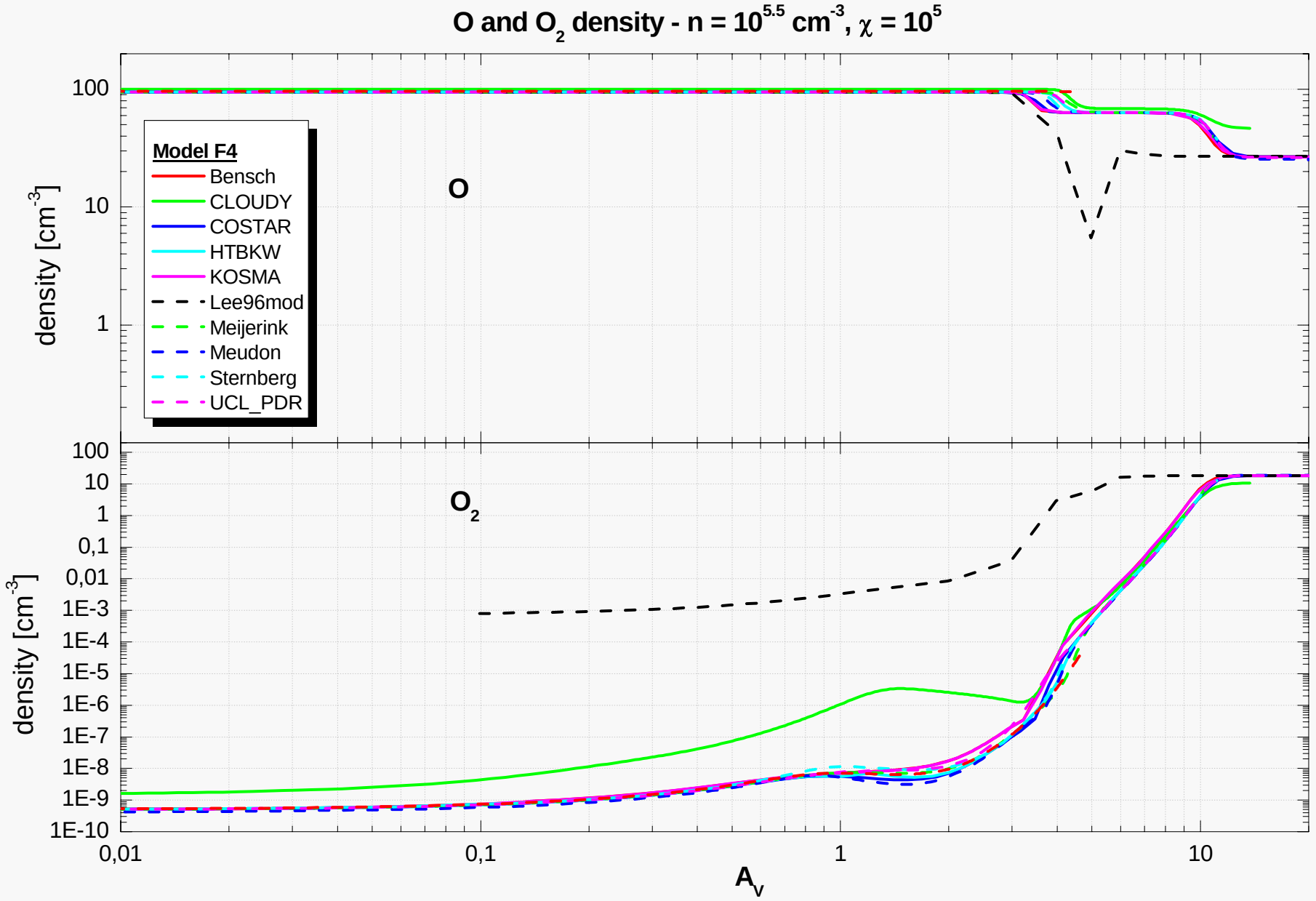

O and O2 density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
density [cm^-3]
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
0,1
1
10
AV


O and O2 density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
density [cm^-3]
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
0,1
1
10
AV

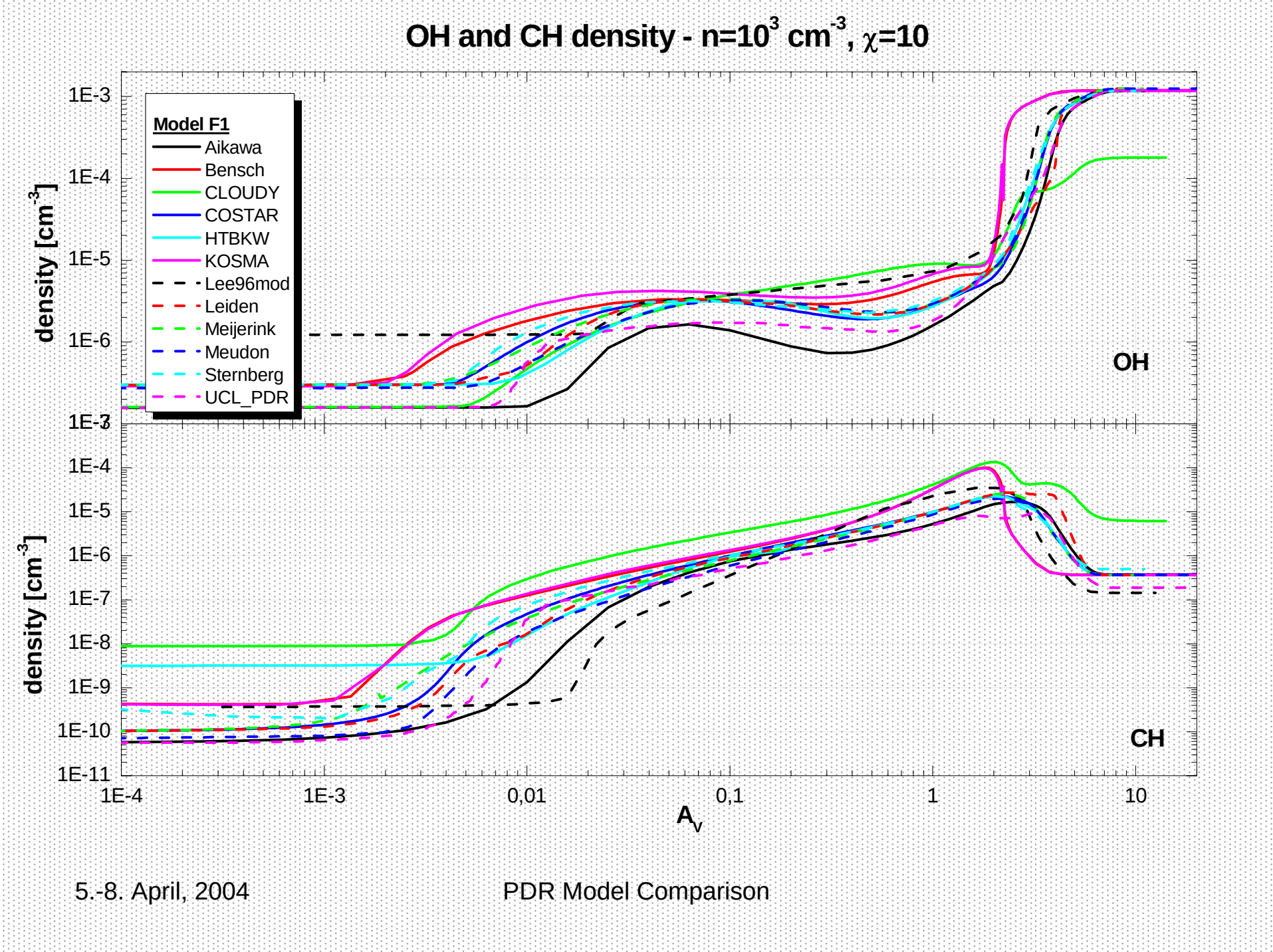

O and O2 density - n=10^5.5 cm^-3, χ=10
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
density [cm^-3]
100
10
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
Av

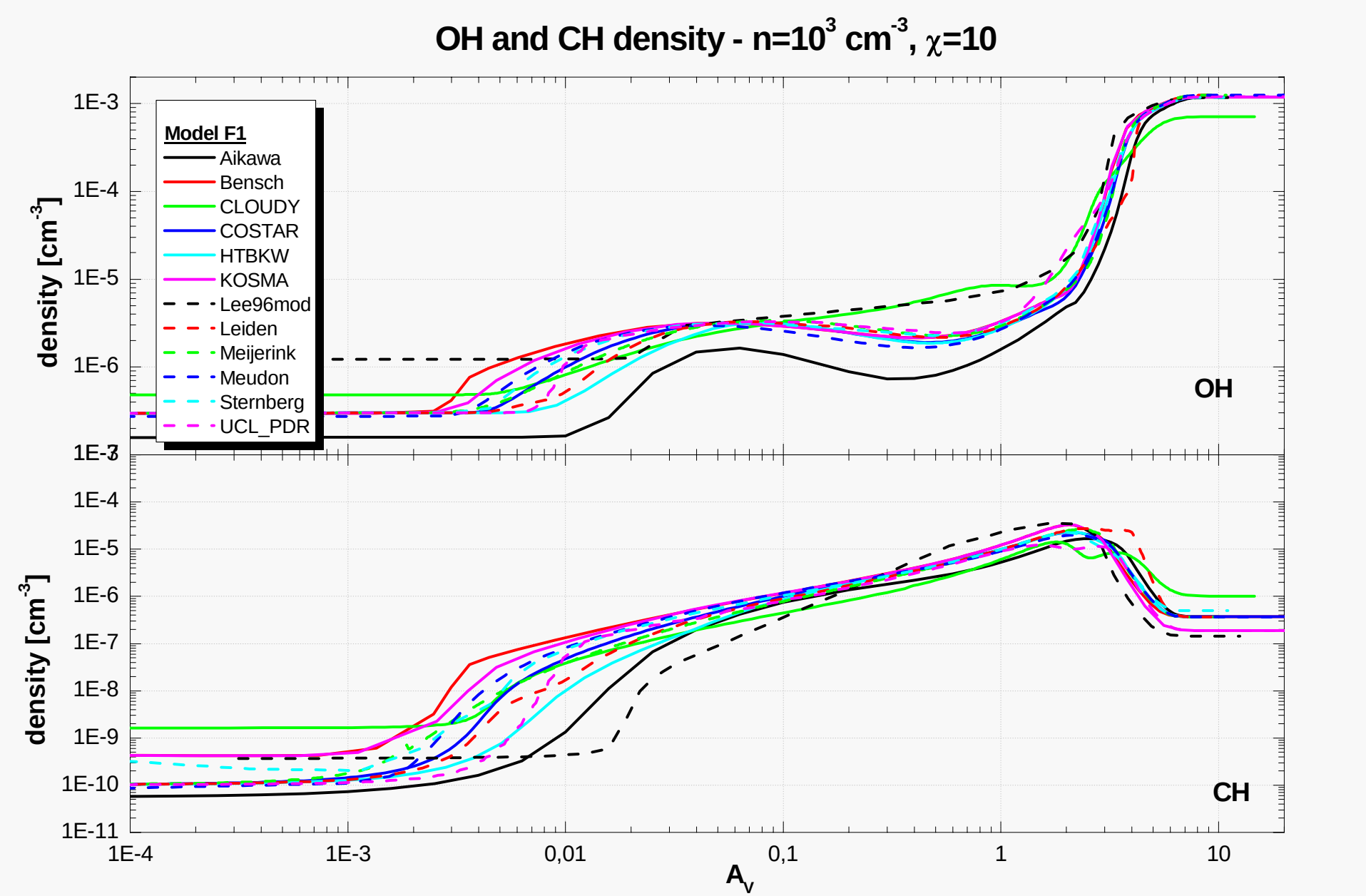

O and O2 density - n=10^5.5 cm^-3, χ=10
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
0,01
0,1
1
10
AV

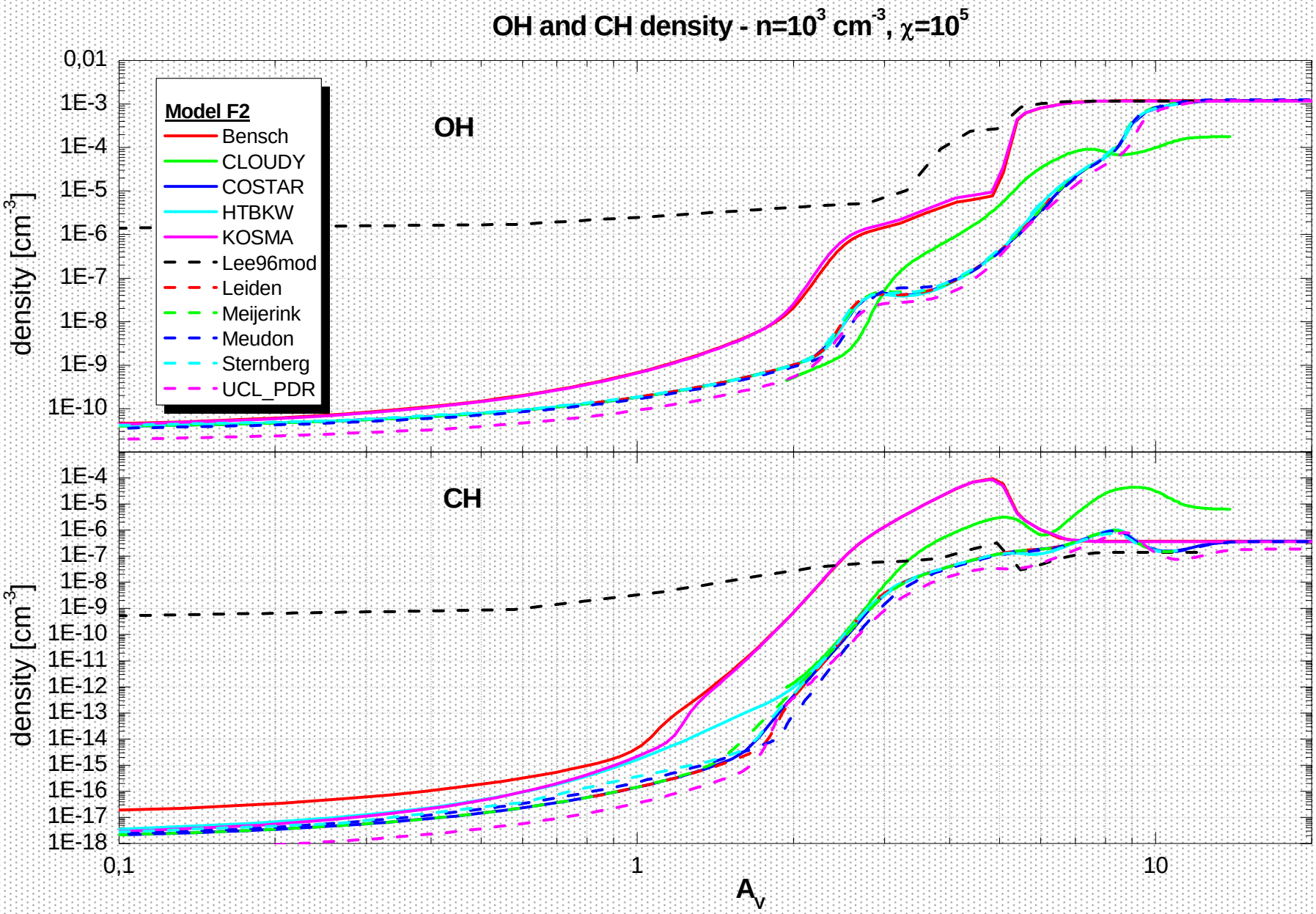

O and O2 density - n = 10^5.5 cm^-3, χ = 10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
0,01
0,1
1
10
Av

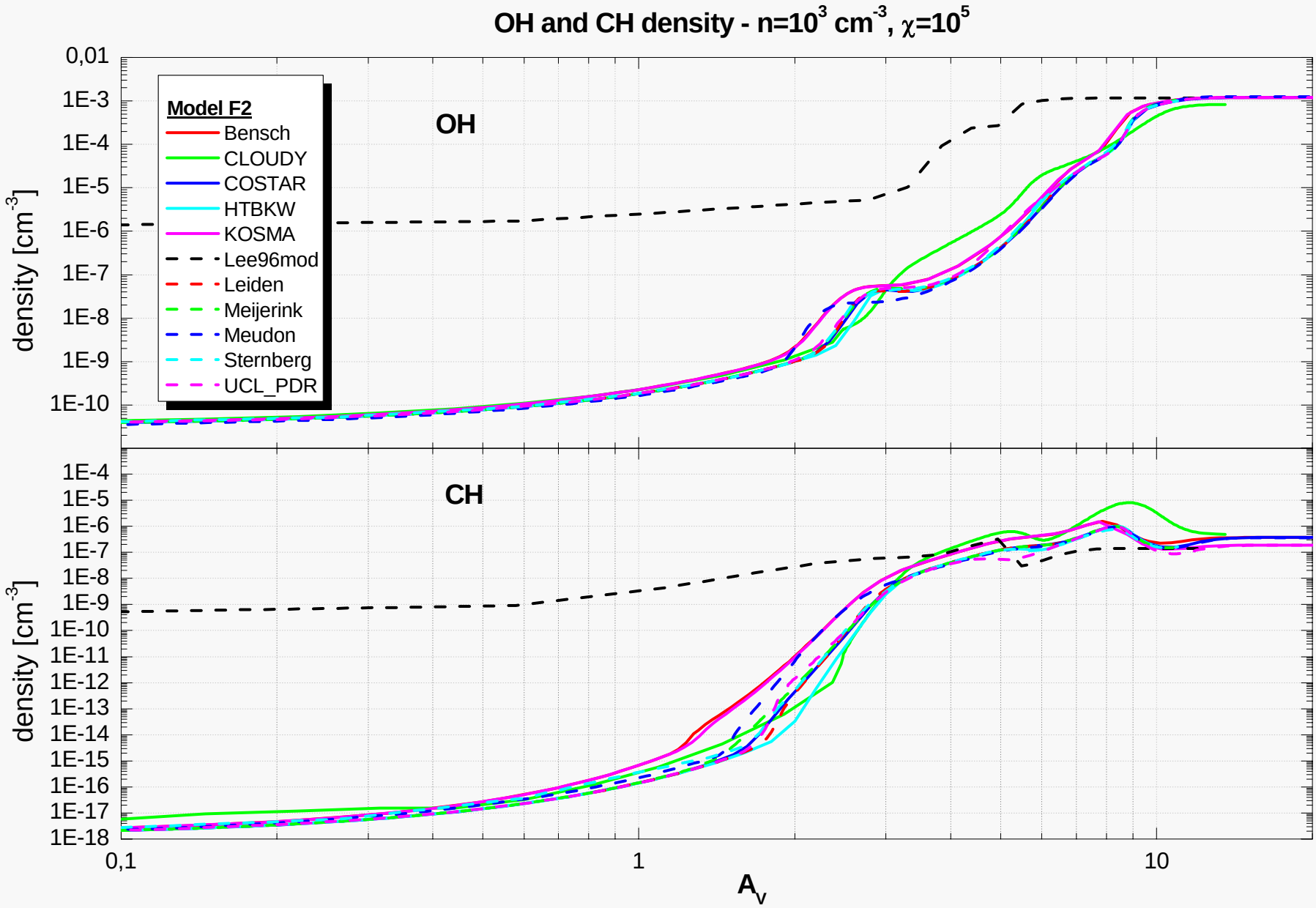

O and O2 density - n = 10^5.5 cm^-3, χ = 10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
O
O2
density [cm^-3]
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
0,01
0,1
1
10
AV

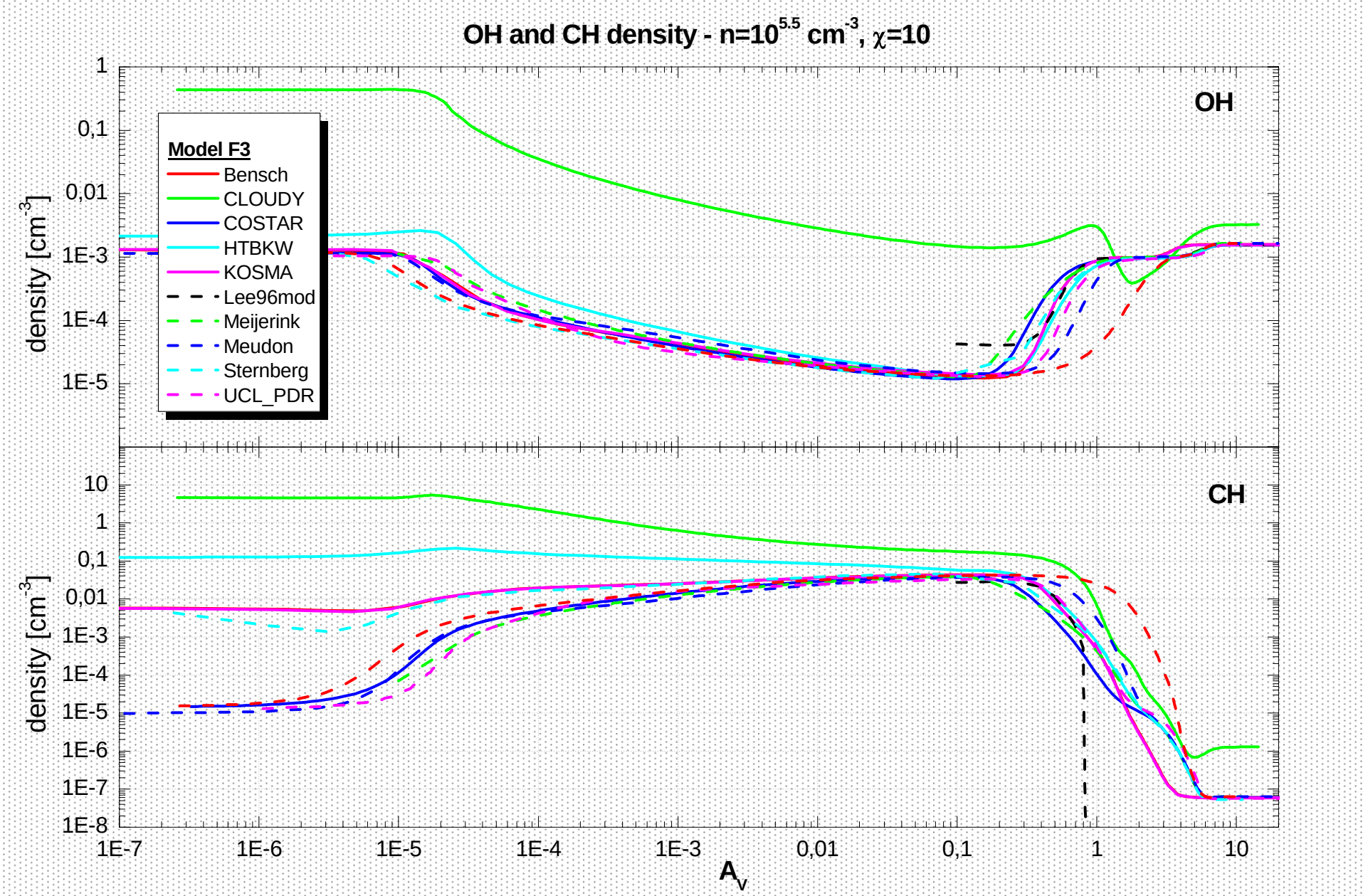
OH and CH density

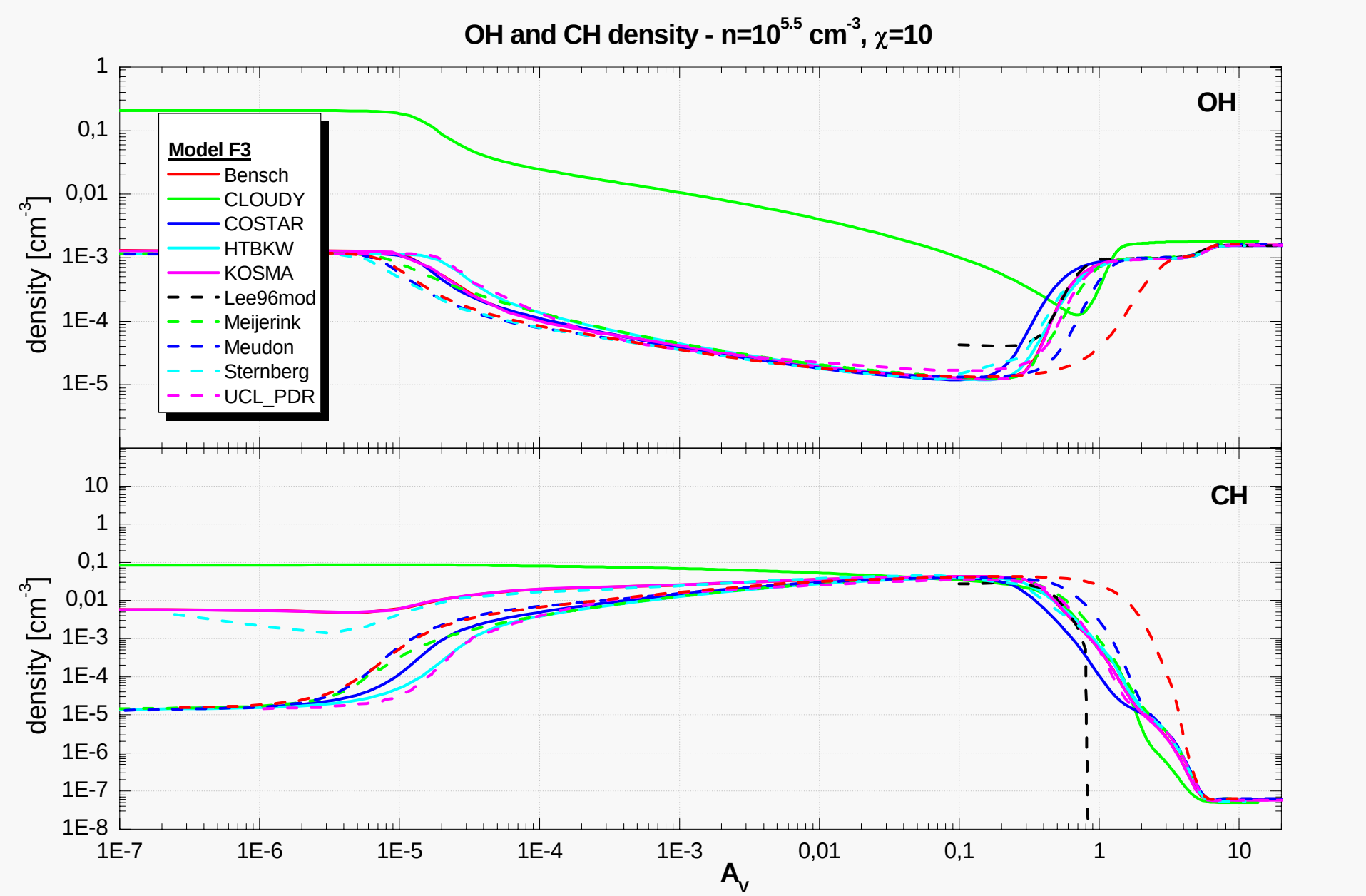

OH and CH density - n=10^3 cm^-3, χ=10
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
OH
CH
A_V
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
0,01
0,1
1
10

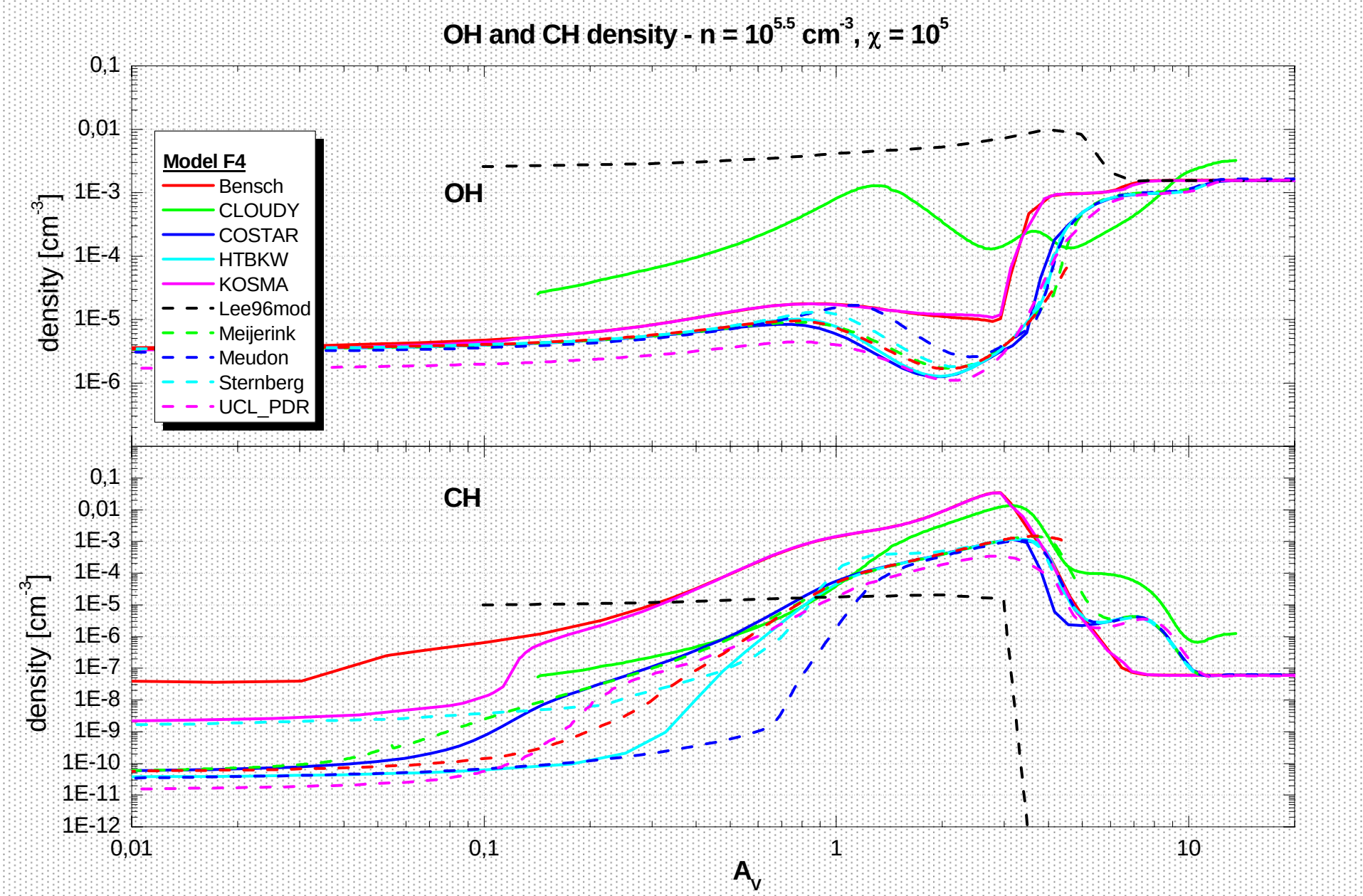

OH and CH density - n=10^3 cm^-3, χ=10
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
OH
CH
A_V
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
0,01
0,1
1
10

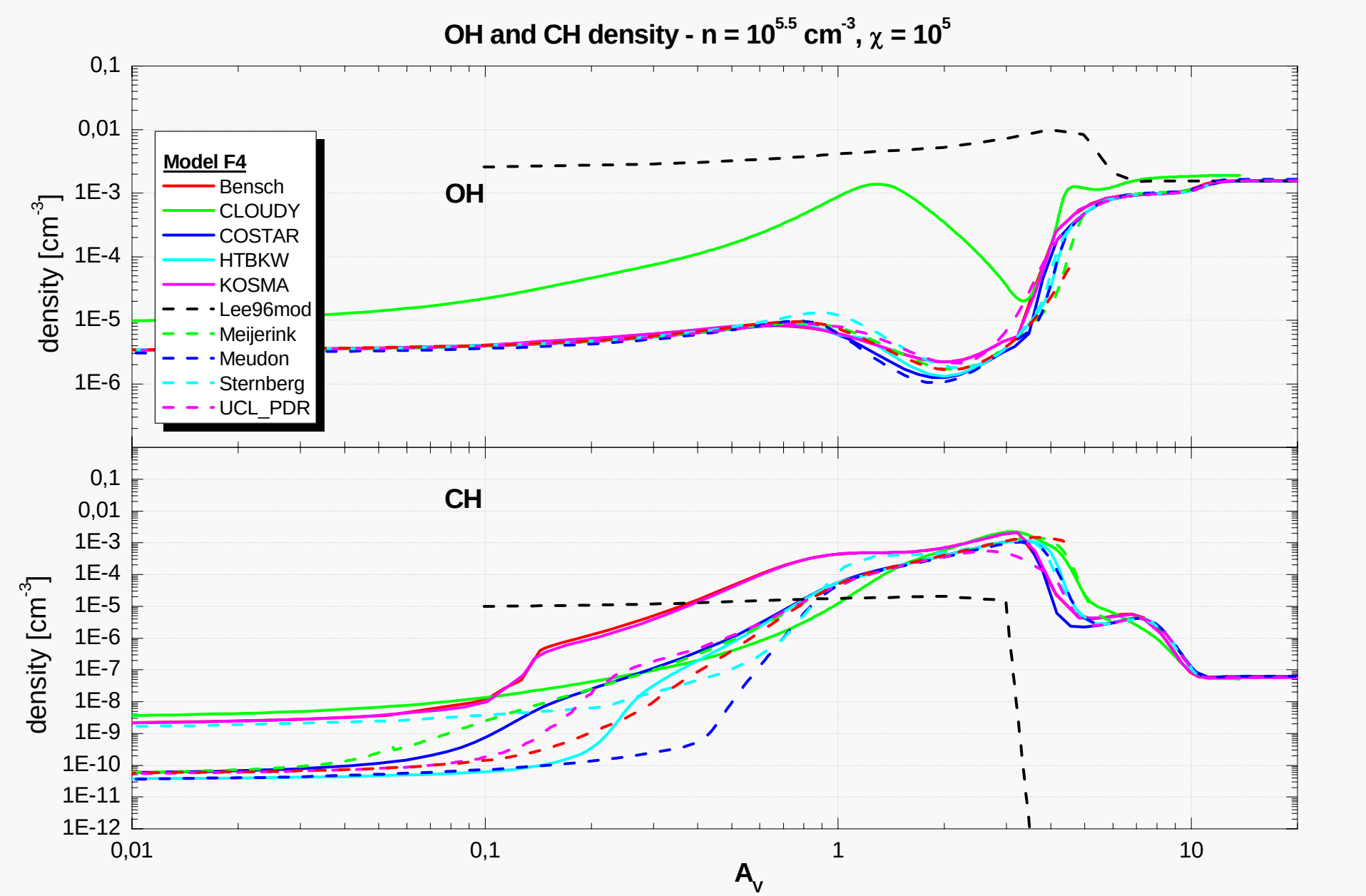

OH and CH density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
OH
CH
density [cm^-3]
density [cm^-3]
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
0,1
1
10
A_v


OH and CH density - n=10^3 cm^-3, χ=10^5
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
OH
CH
density [cm^-3]
density [cm^-3]
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
0,1
1
10
A_V

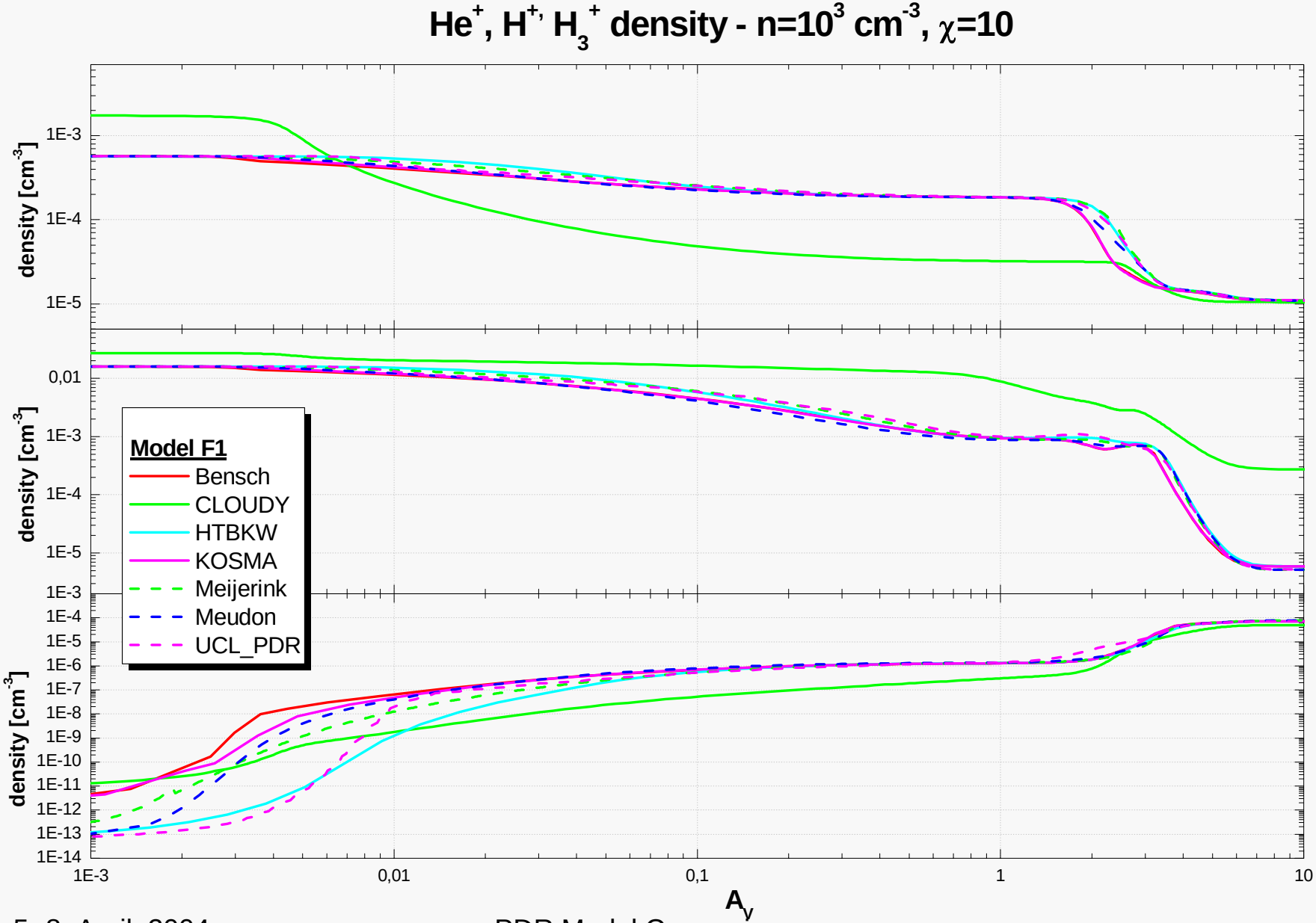

OH and CH density - n=10^5.5 cm^-3, χ=10
OH
CH
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
density [cm^-3]
1
0,1
0,01
1E-3
1E-4
1E-5
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_v

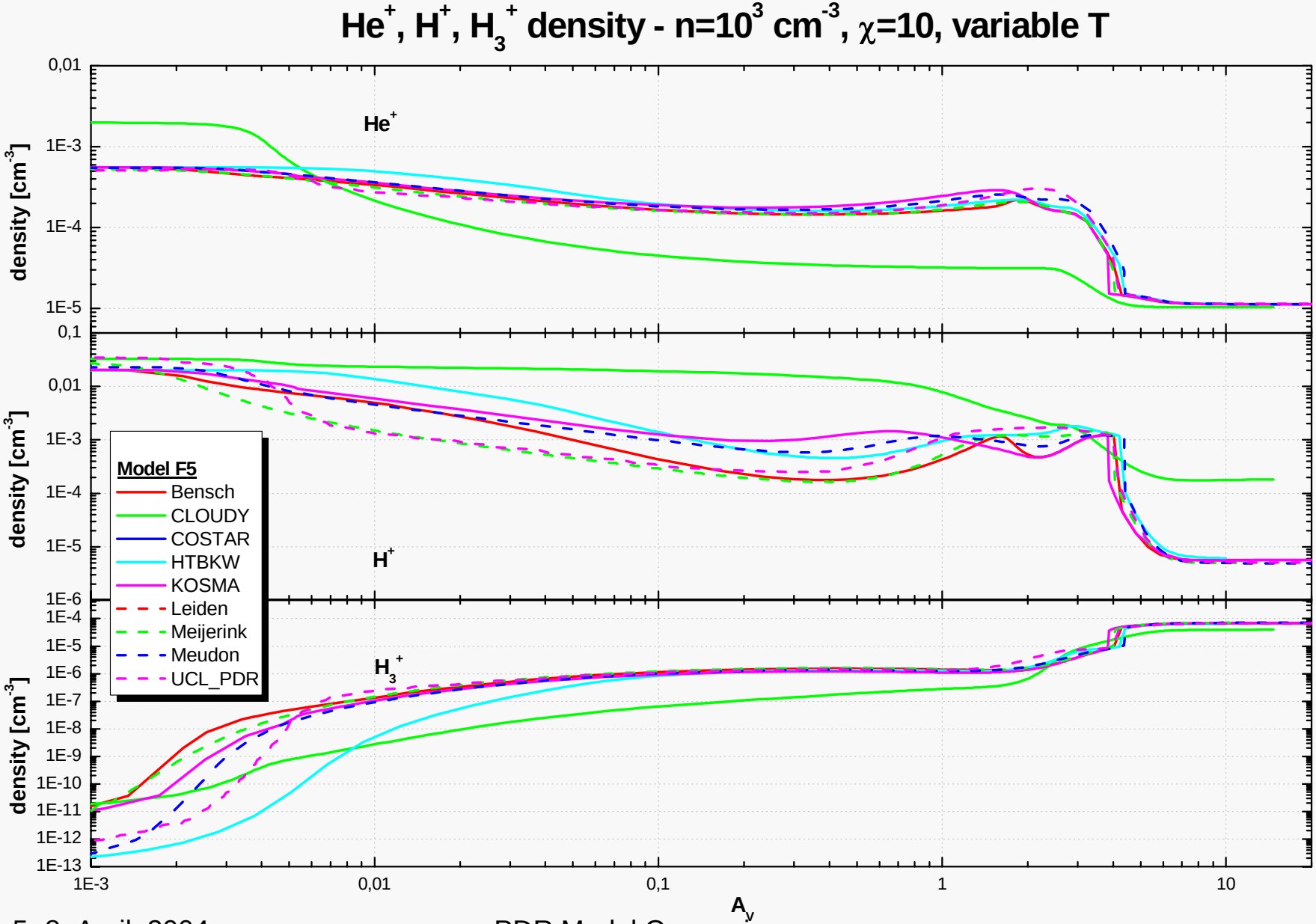

OH and CH density - n=10^5.5 cm^-3, χ=10
OH
CH
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
density [cm^-3]
density [cm^-3]
1
0,1
0,01
1E-3
1E-4
1E-5
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

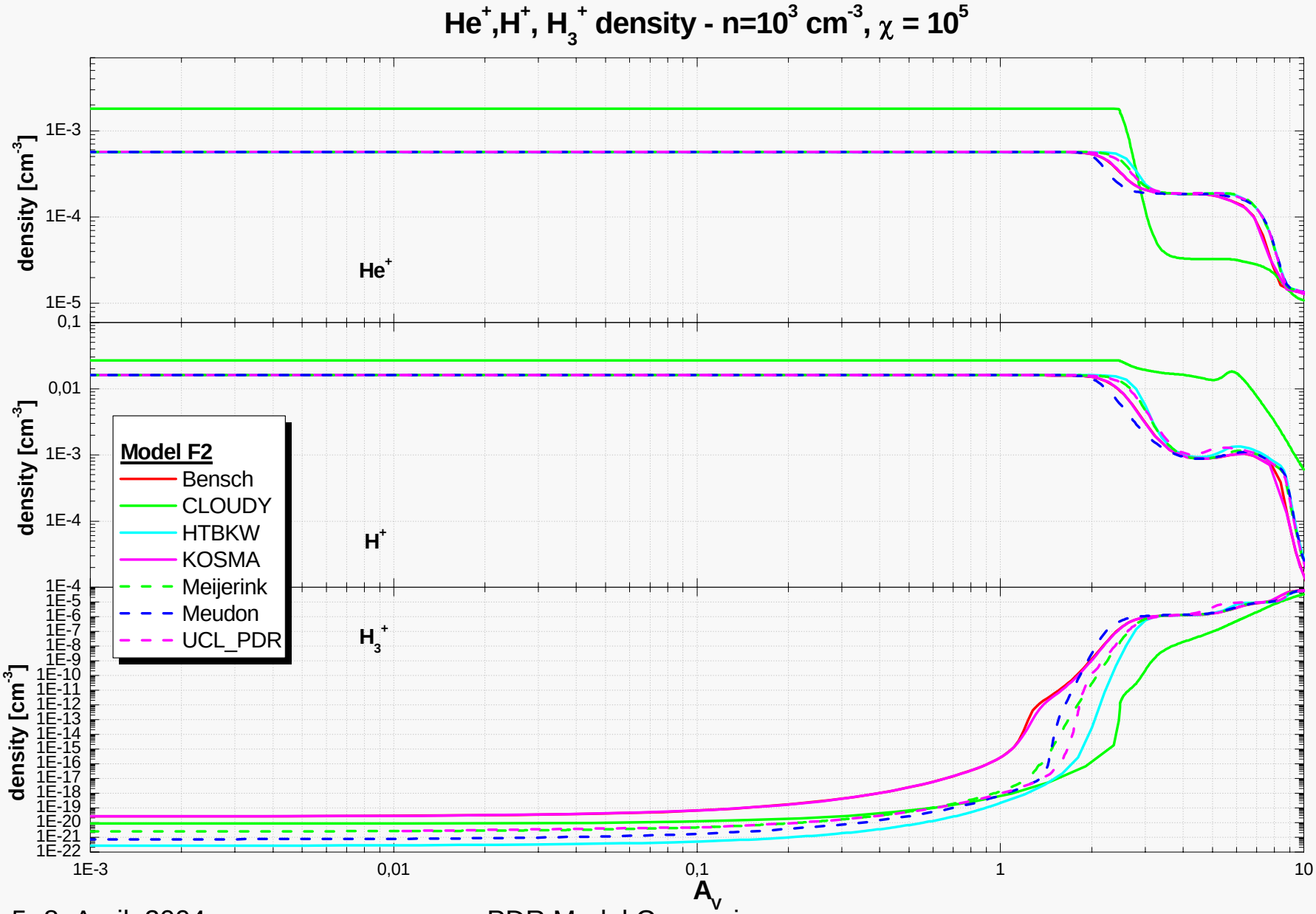

OH and CH density - n = 10^5.5 cm^-3, χ = 10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
OH
CH
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
0,01
0,1
1
10
A_V

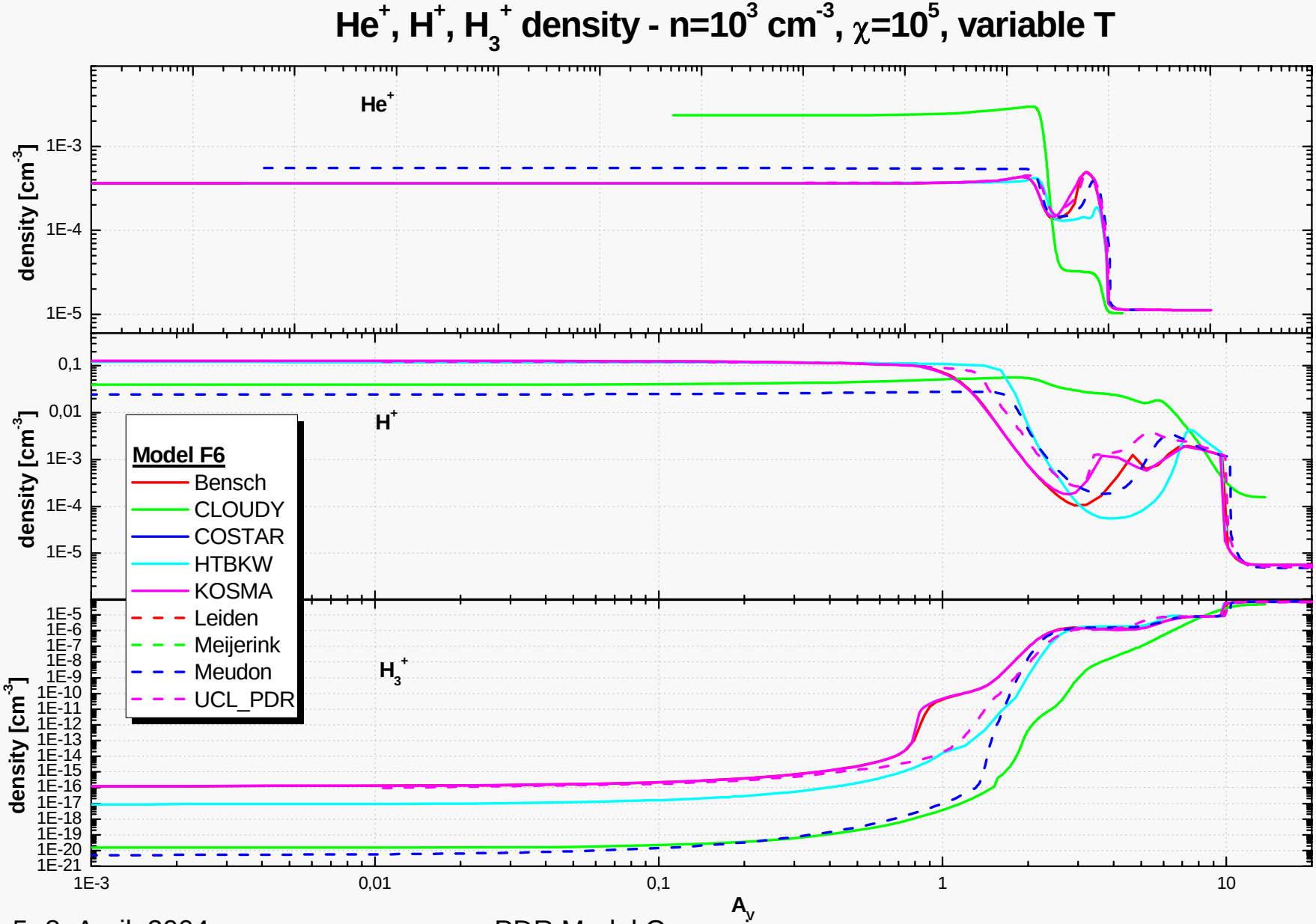

OH and CH density - n = 10^5.5 cm^-3, χ = 10^5
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Meijerink
Meudon
Sternberg
UCL_PDR
OH
CH
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
0,01
0,1
1
10
A_V

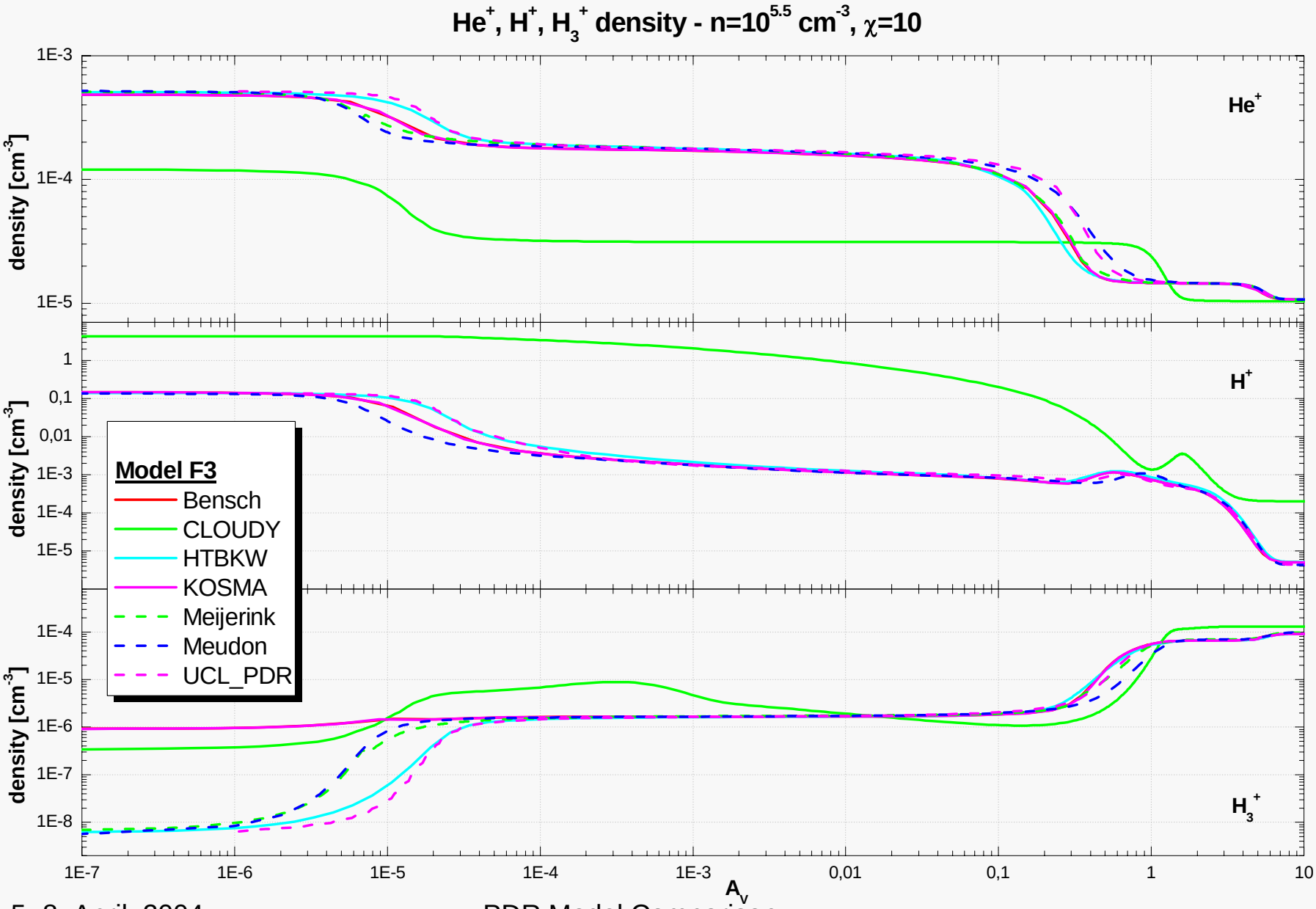
He^+, H^+, and H_3^+ density

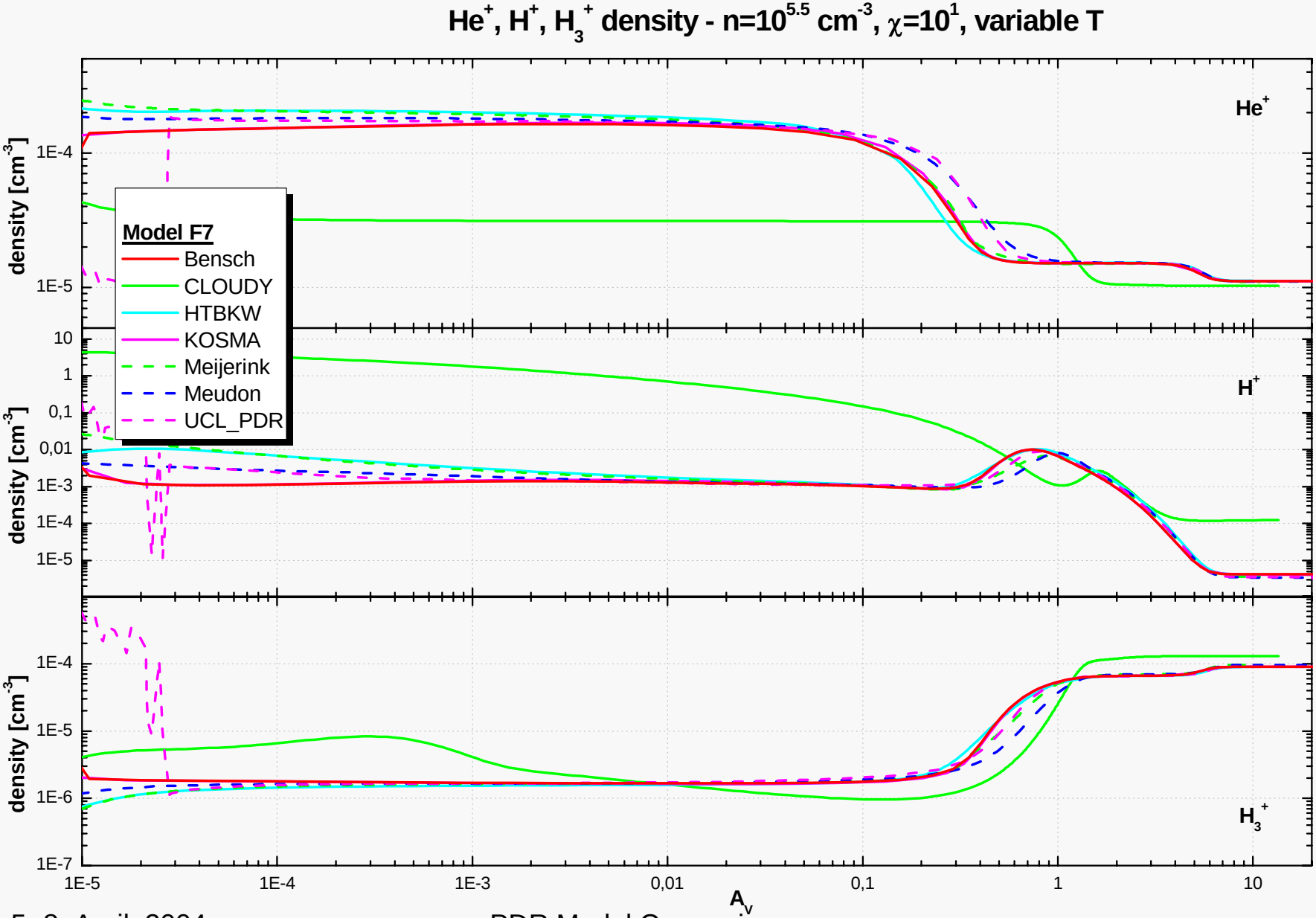

He+, H+, H3+ density - n=10^3 cm^-3, χ=10
density [cm^-3]
1E-3
1E-4
1E-5
0,01
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
Model F1
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
0,01
0,1
1
10
Av

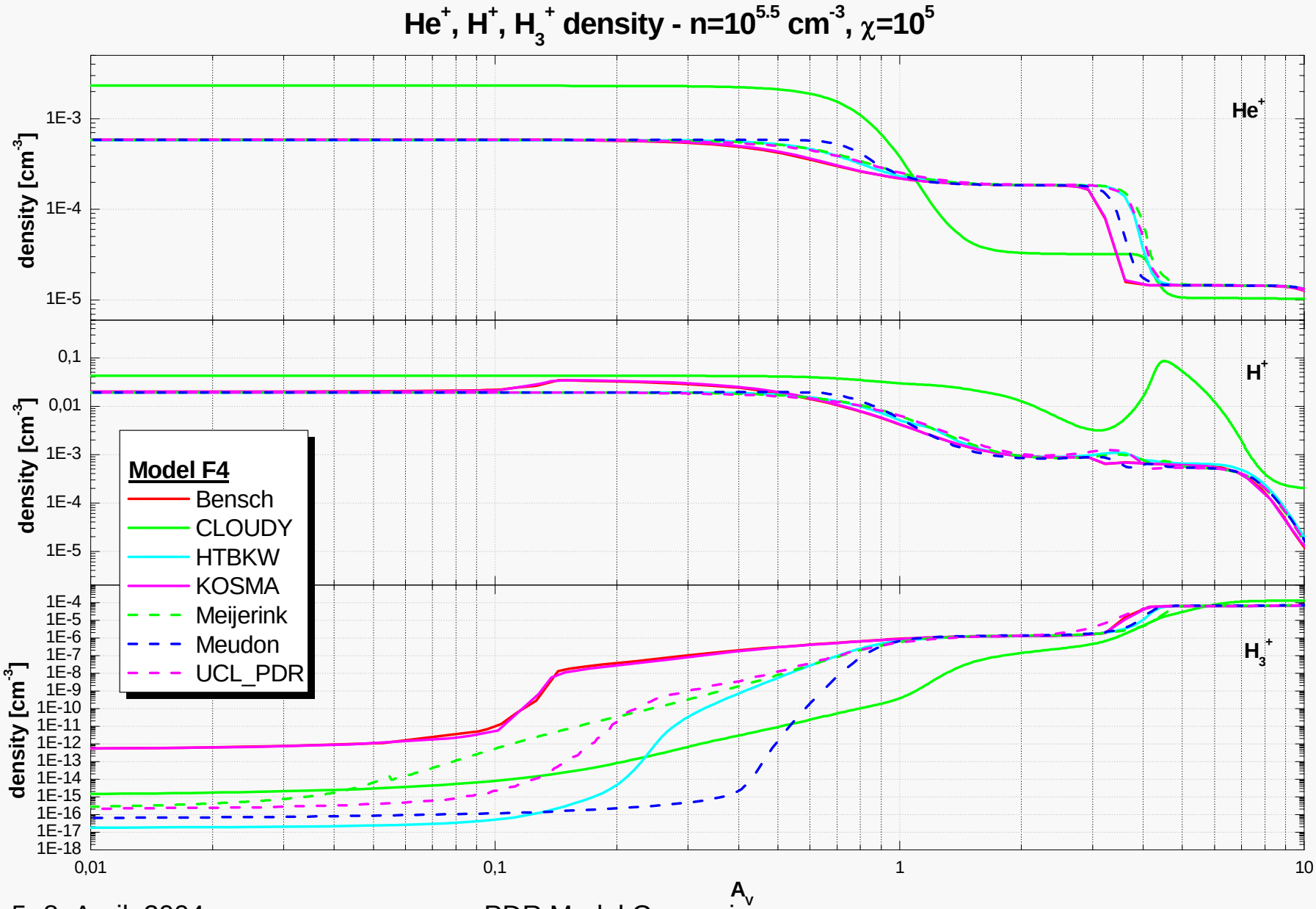

He+, H+, H3+ density - n=10^3 cm^-3, χ=10, variable T
density [cm^-3]
He+
H+
H3+
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
Av
1E-3
0,01
0,1
1
10

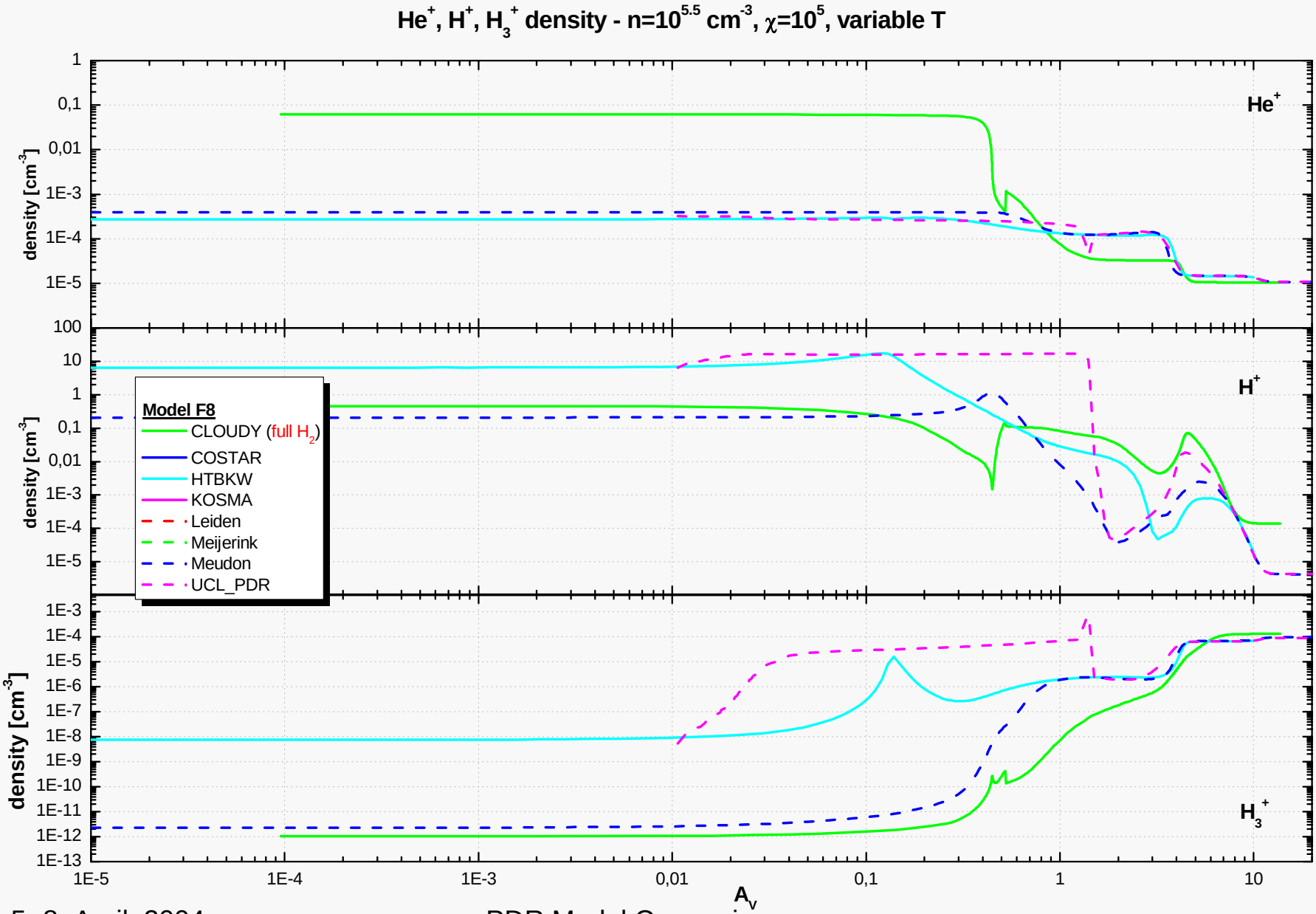

He+,H+, H3+ density - n=10^3 cm^-3, χ = 10^5
density [cm^-3]
He+
H+
H3+
Model F2
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
1E-3
1E-4
1E-5
0,1
0,01
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
1E-19
1E-20
1E-21
1E-22
0,01
1
10
Av


He+, H+, H3+ density - n=10^3 cm^-3, χ=10^5, variable T
He+
H+
H3+
density [cm^-3]
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
1E-4
1E-5
0,1
0,01
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
1E-19
1E-20
1E-21
0,01
1
10
Av

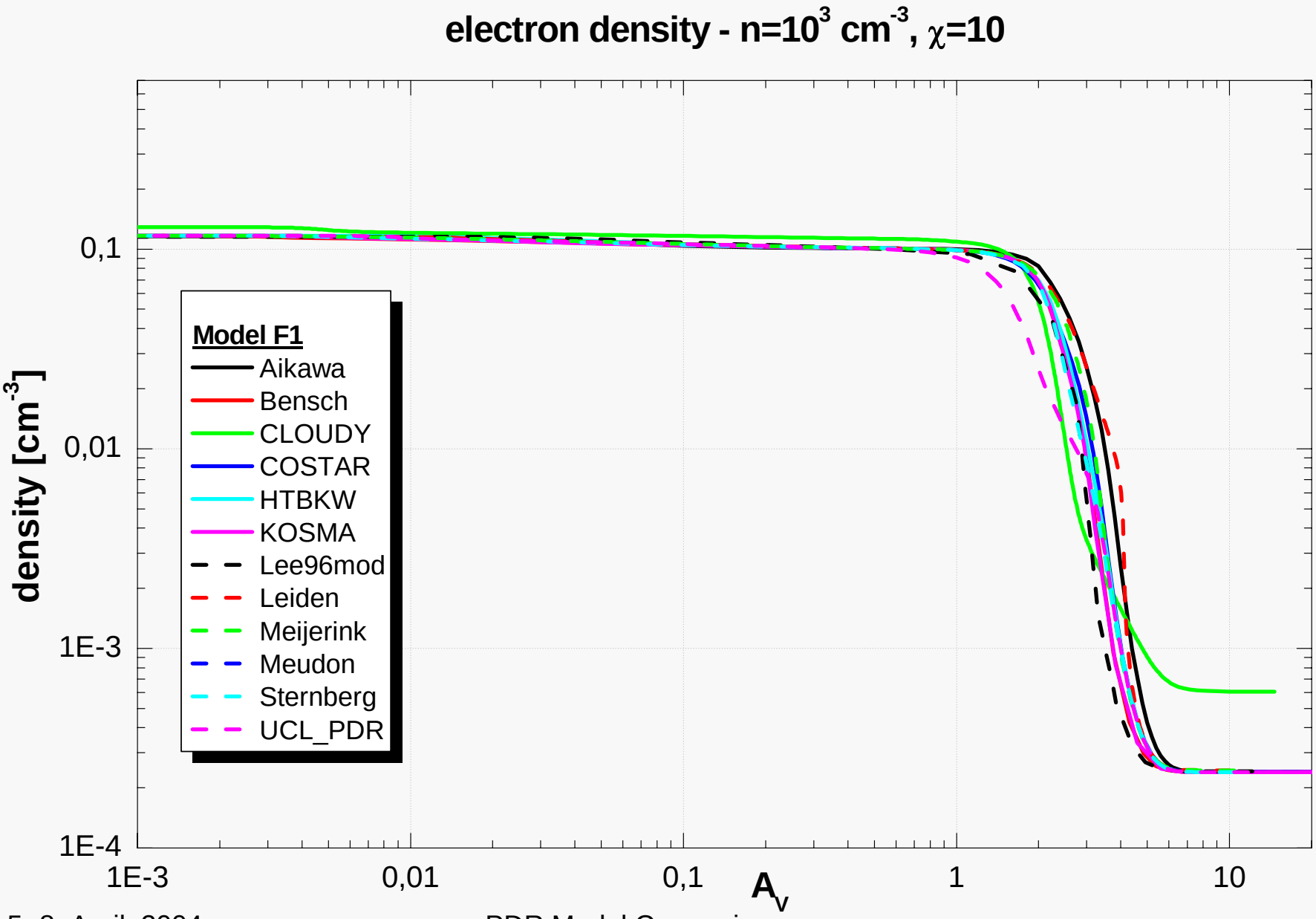

He+, H+, H3+ density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
1E-3
1E-4
1E-5
He+
1
0,1
0,01
1E-3
1E-4
1E-5
H+
Model F3
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
1E-4
1E-5
1E-6
1E-7
1E-8
H3+
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV

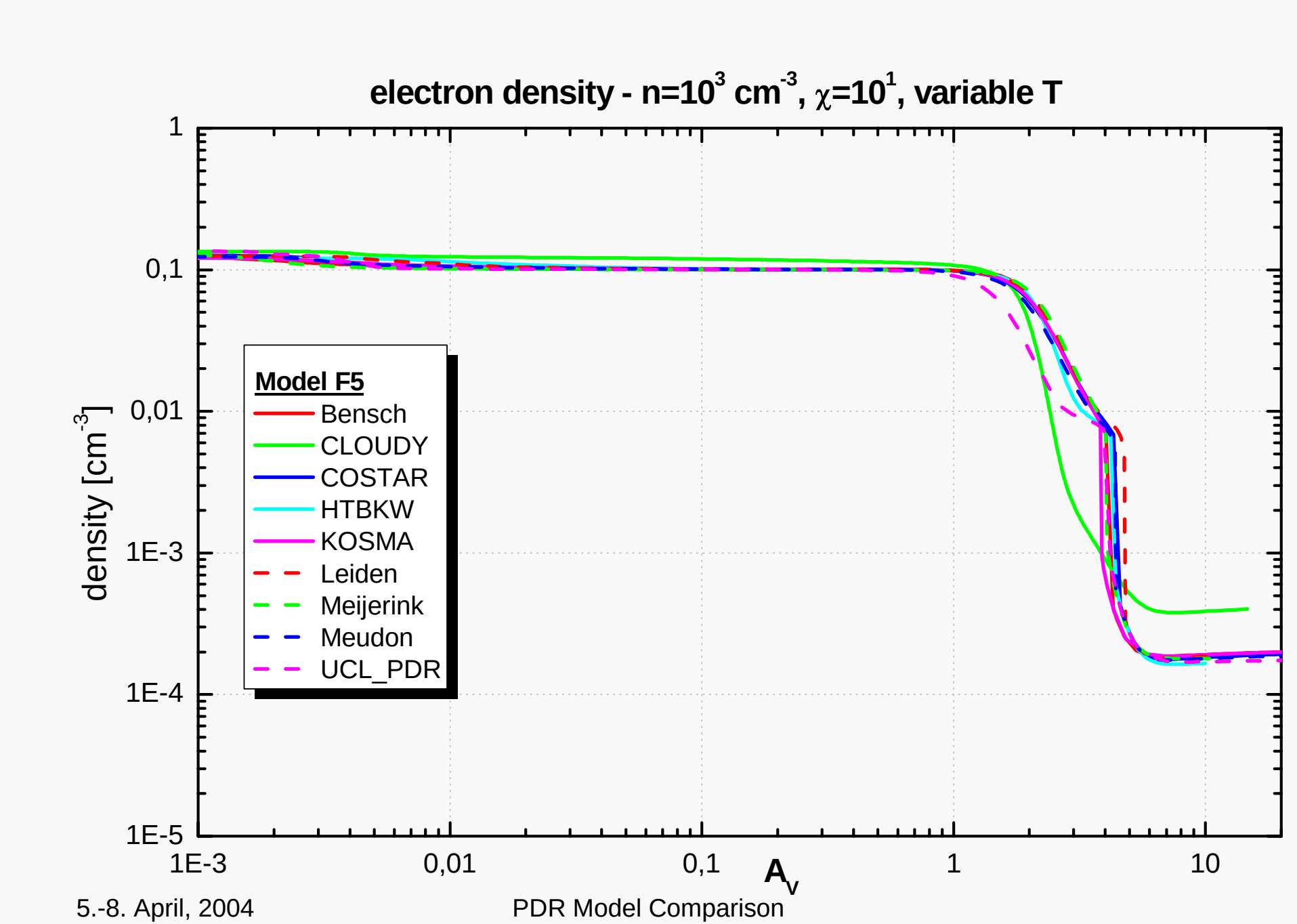

He+, H+, H3+ density - n=10^5.5 cm^-3, χ=10^1, variable T
Model F7
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
He+
H+
H3+
density [cm-3]
1E-4
1E-5
10
1
0,1
0,01
1E-3
1E-6
1E-7
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV

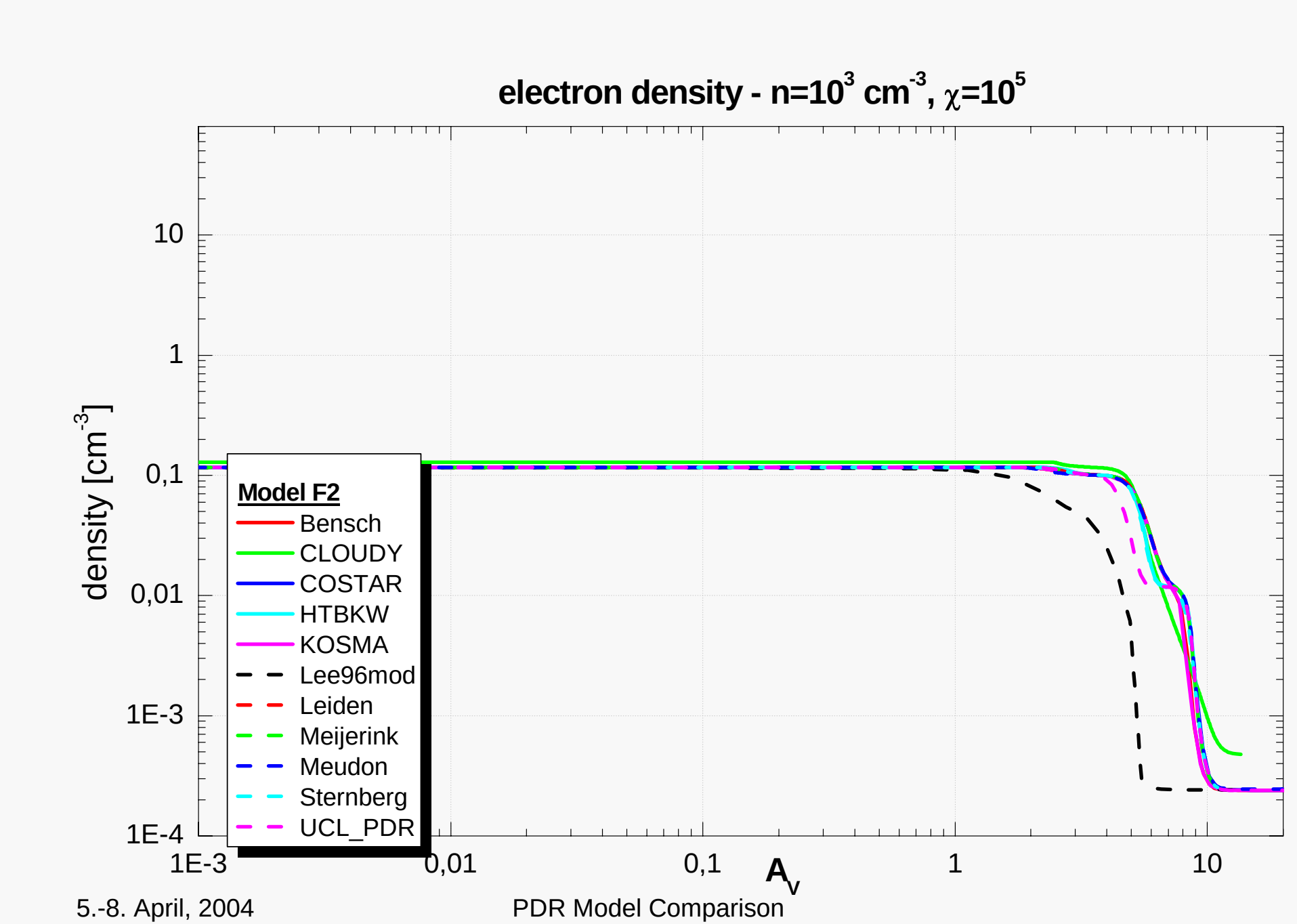

He+, H+, H3+ density - n=10^5.5 cm^-3, χ=10^5
density [cm^-3]
1E-3
1E-4
1E-5
He+
0,1
0,01
1E-3
1E-4
1E-5
H+
Model F4
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-14
1E-15
1E-16
1E-17
1E-18
H3+
0,01
0,1
1
10
Av

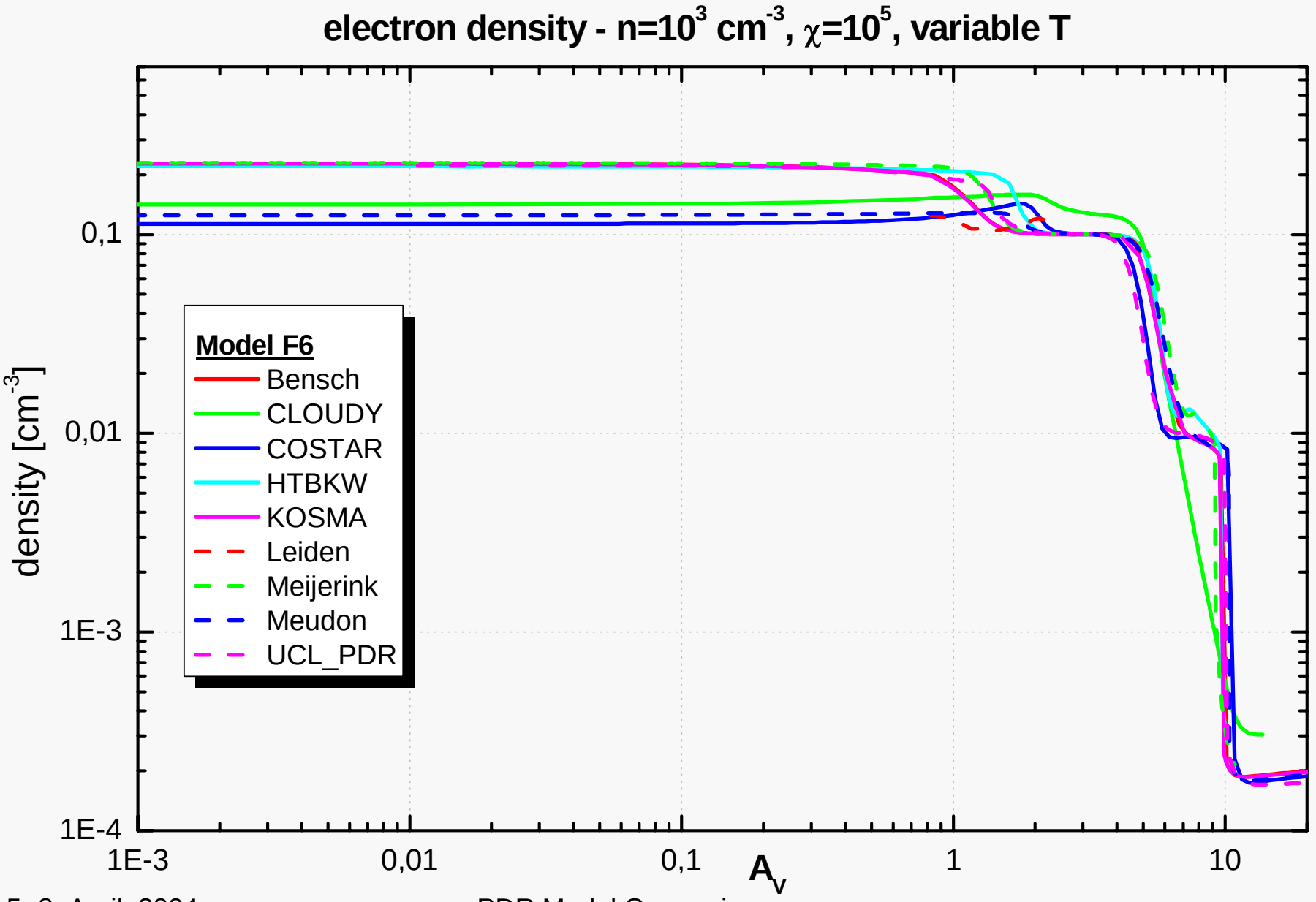

He+, H+, H3+ density - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm^-3]
He+
H+
H3+
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1
0,1
0,01
1E-3
1E-4
1E-5
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-3
1E-4
1E-5
1E-6
1E-7
1E-8
1E-9
1E-10
1E-11
1E-12
1E-13
1E-5
1E-4
1E-3
0,01
0,1
1
10
AV

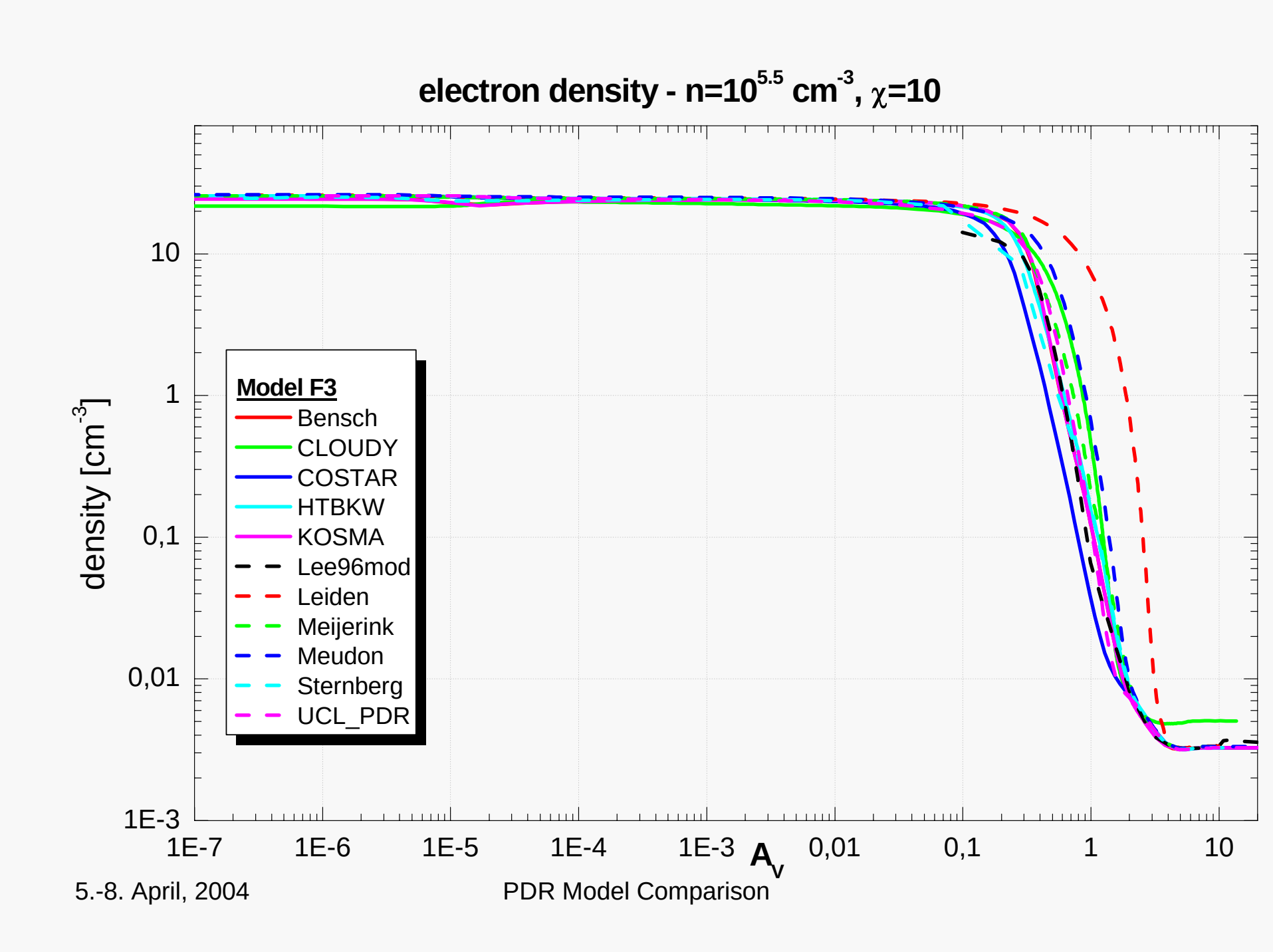
electron density

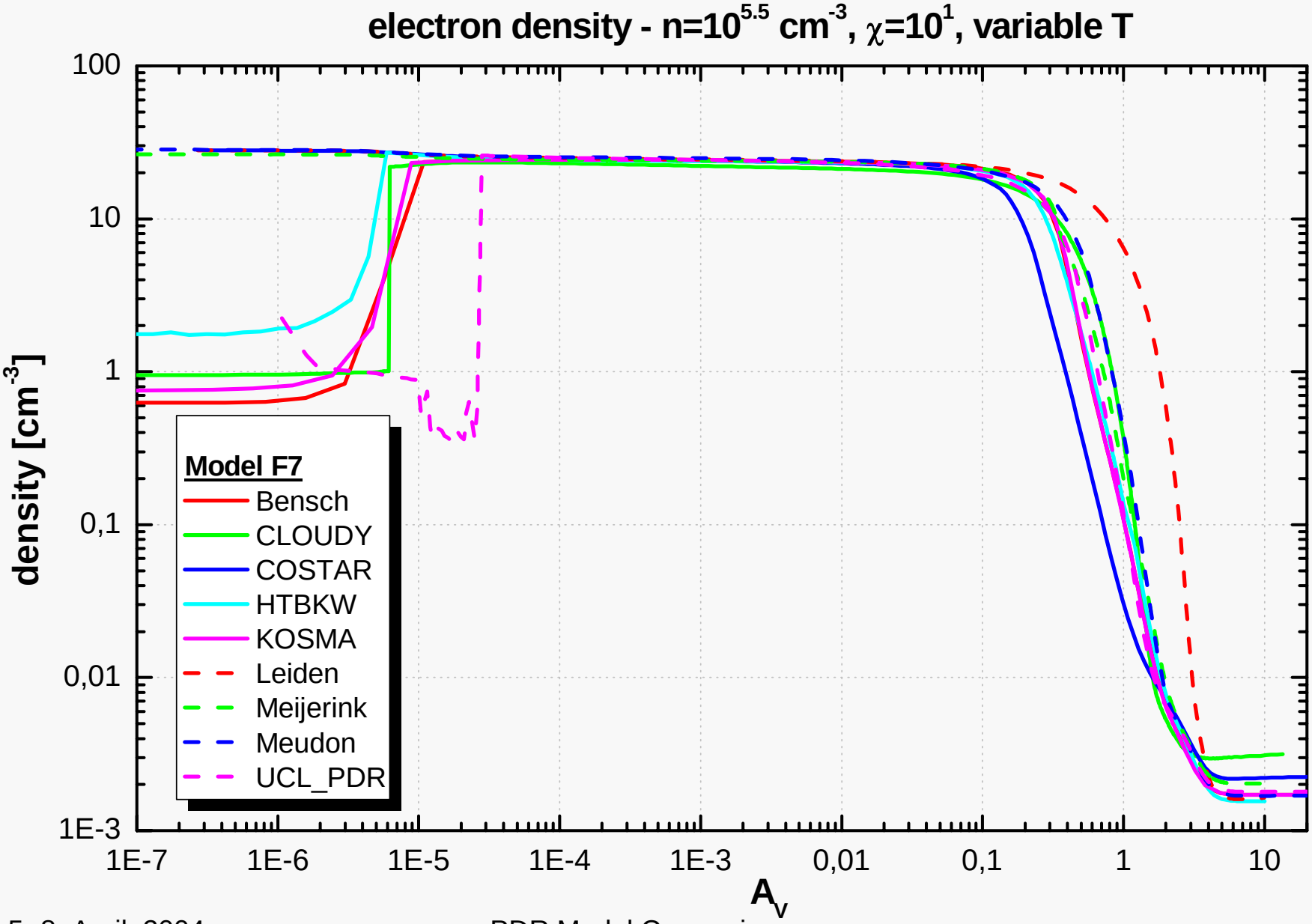

electron density - n=10^3 cm^-3, χ=10
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-3
0,01
0,1
1
10
A_V
Model F1
Aikawa
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR

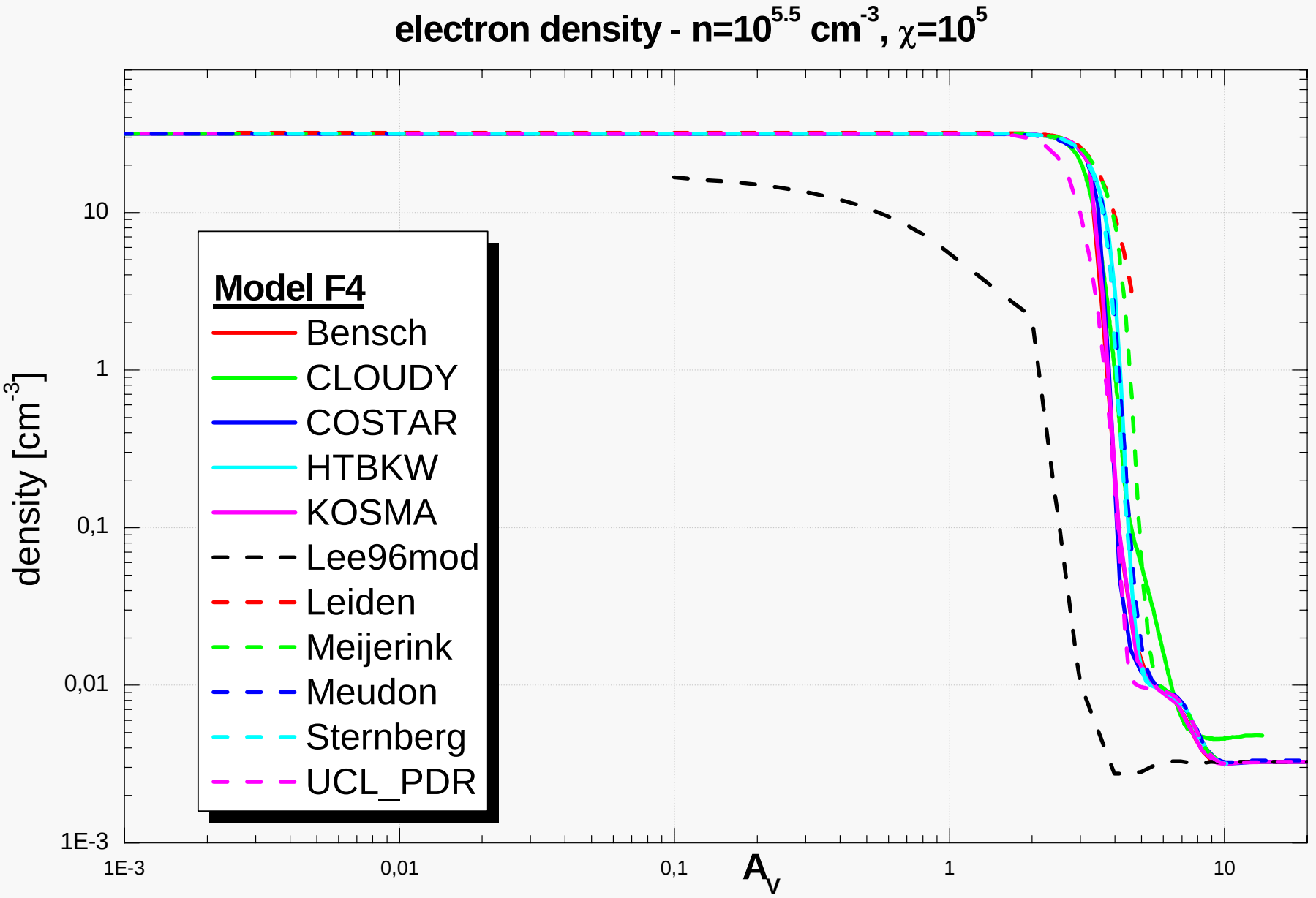

electron density - n=10^3 cm^-3, χ=10^1, variable T
density [cm^-3]
1
0,1
0,01
1E-3
1E-4
1E-5
1E-3
0,01
0,1
1
10
A_V
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

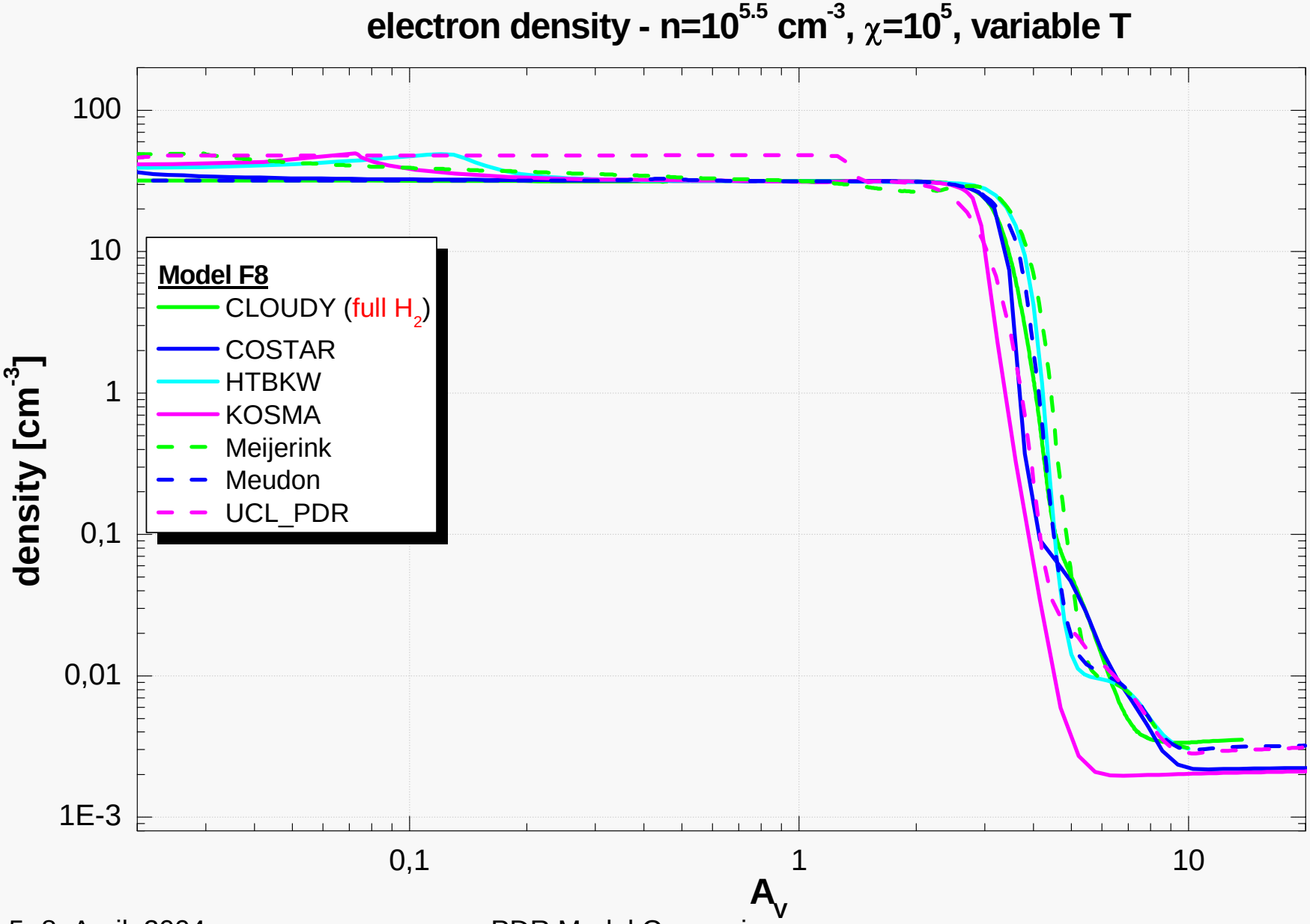

electron density - n=10^3 cm^-3, χ=10^5
density [cm^-3]
10
1
0,1
0,01
1E-3
1E-4
1E-3
0,01
0,1
1
10
A_V
Model F2
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR


electron density - n=10^3 cm^-3, χ=10^5, variable T
density [cm^-3]
0,1
0,01
1E-3
1E-4
1E-3
0,01
0,1
1
10
A_V
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR


electron density - n=10^5.5 cm^-3, χ=10
density [cm^-3]
10
1
0,1
0,01
1E-3
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V
Model F3
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
5.-8. April, 2004
PDR Model Comparison


electron density - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm^-3]
100
10
1
0,1
0,01
1E-3
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

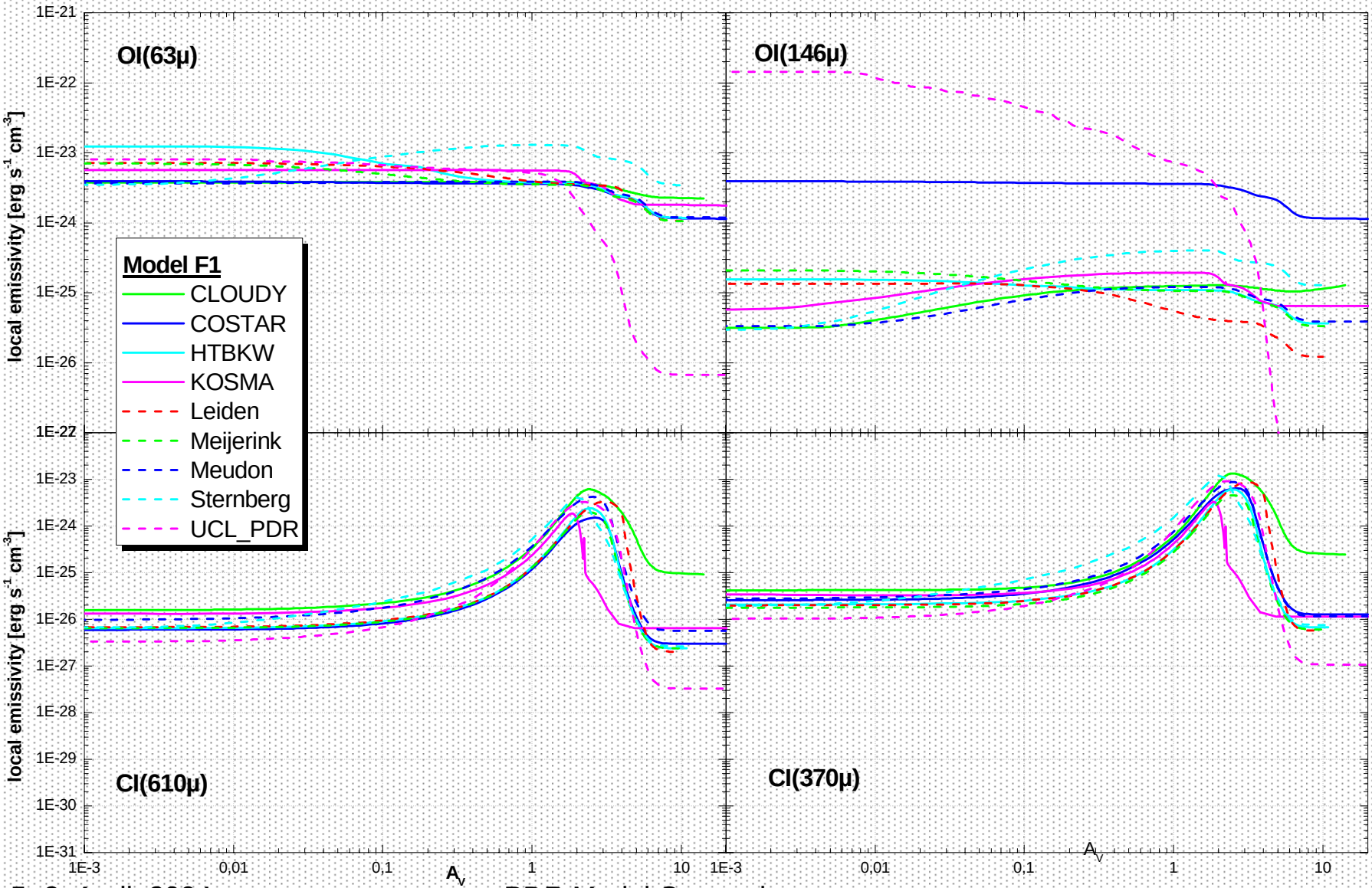

electron density - n=10^5.5 cm^-3, χ=10^5
density [cm^-3]
10
1
0,1
0,01
1E-3
1E-3
0,01
0,1
1
10
A_V
Model F4
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Lee96mod
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR


electron density - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm^-3]
100
10
1
0,1
0,01
1E-3
0,1
1
10
A_V
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR

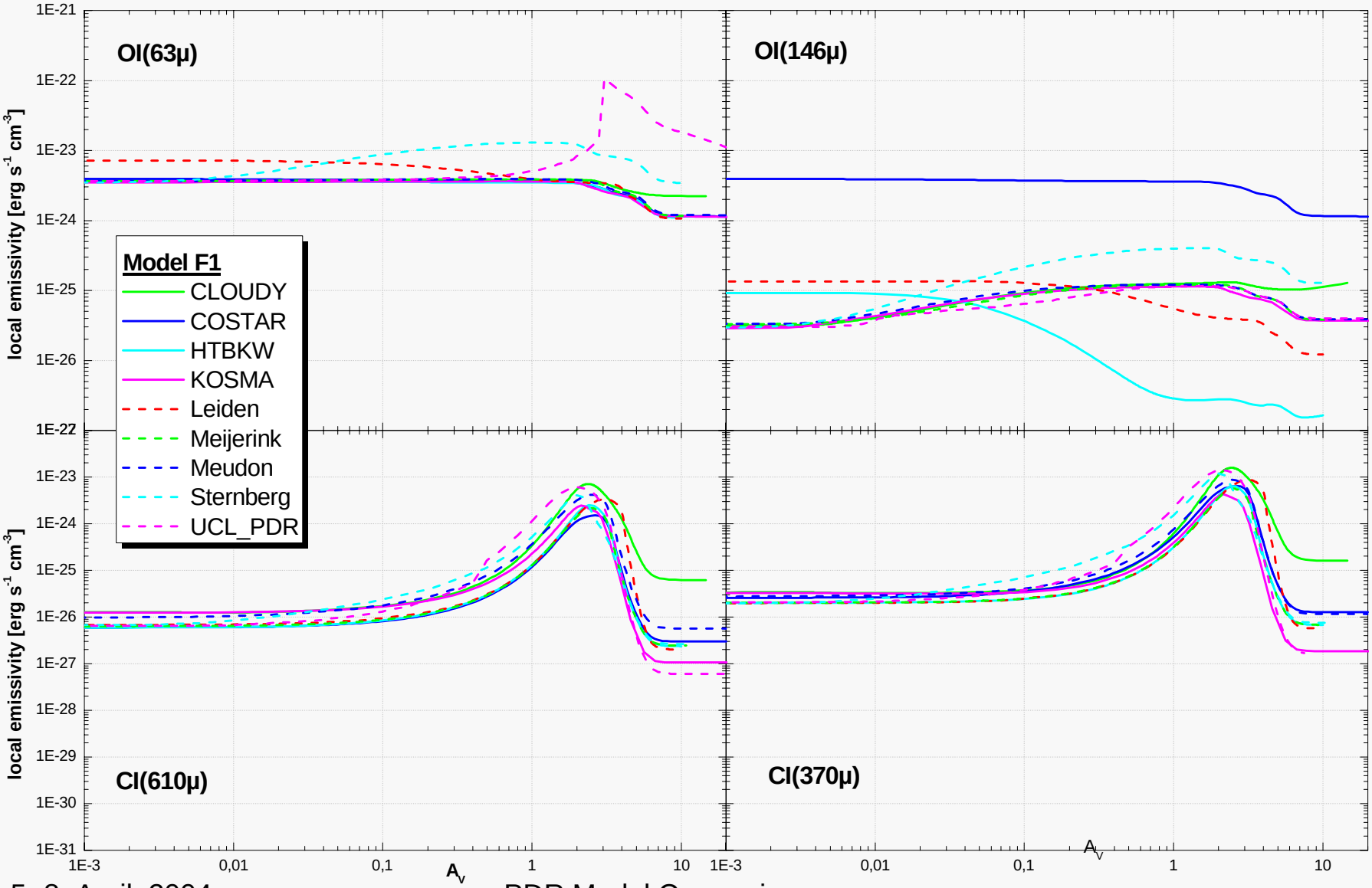
Model Results F1-F8

- photoreaction rates
- densities
- heating/cooling rates
- surface brightnesses

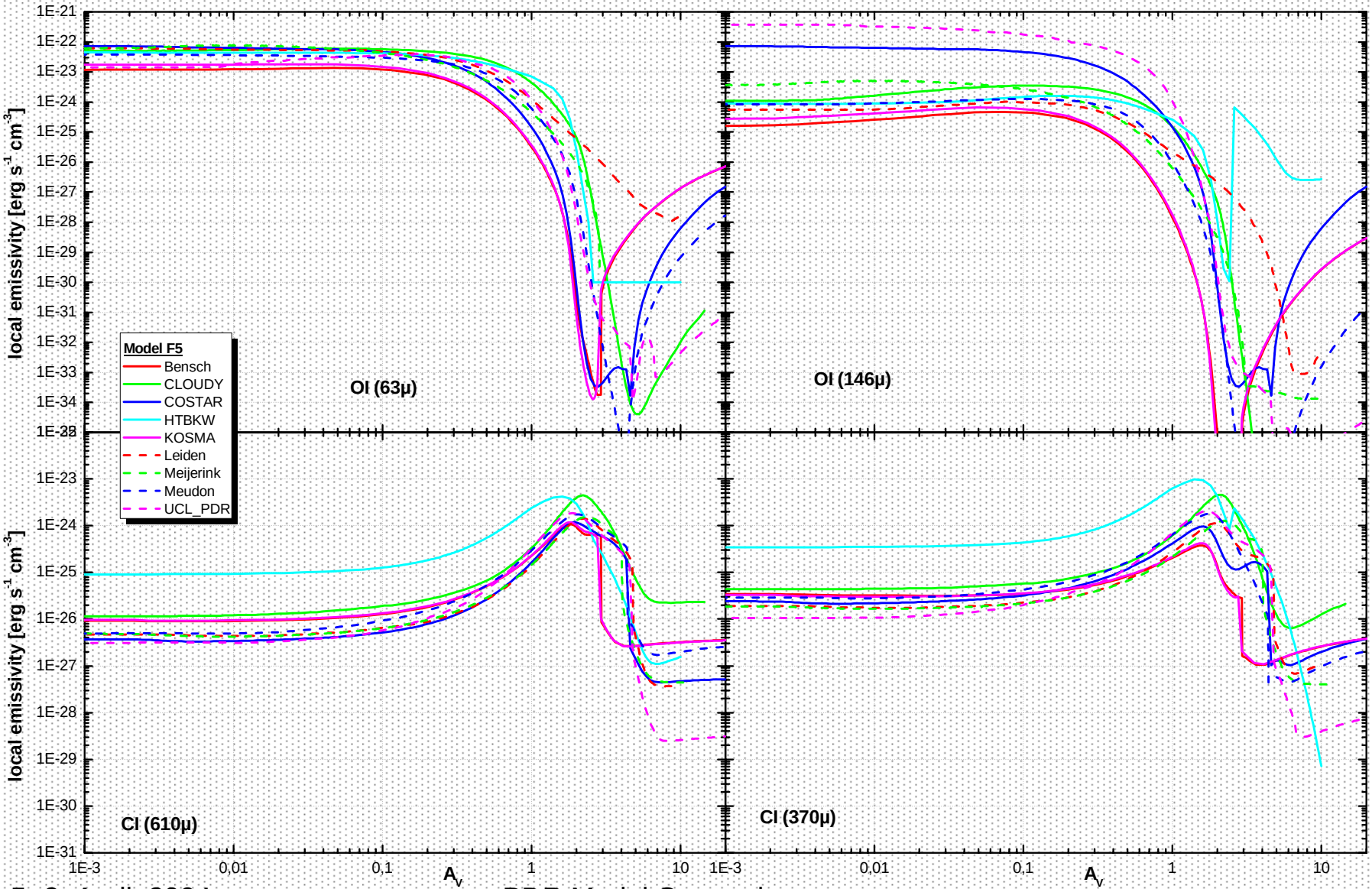
OI an CI cooling lines - $n=10^3$ cm^{-3}, $\chi=10$



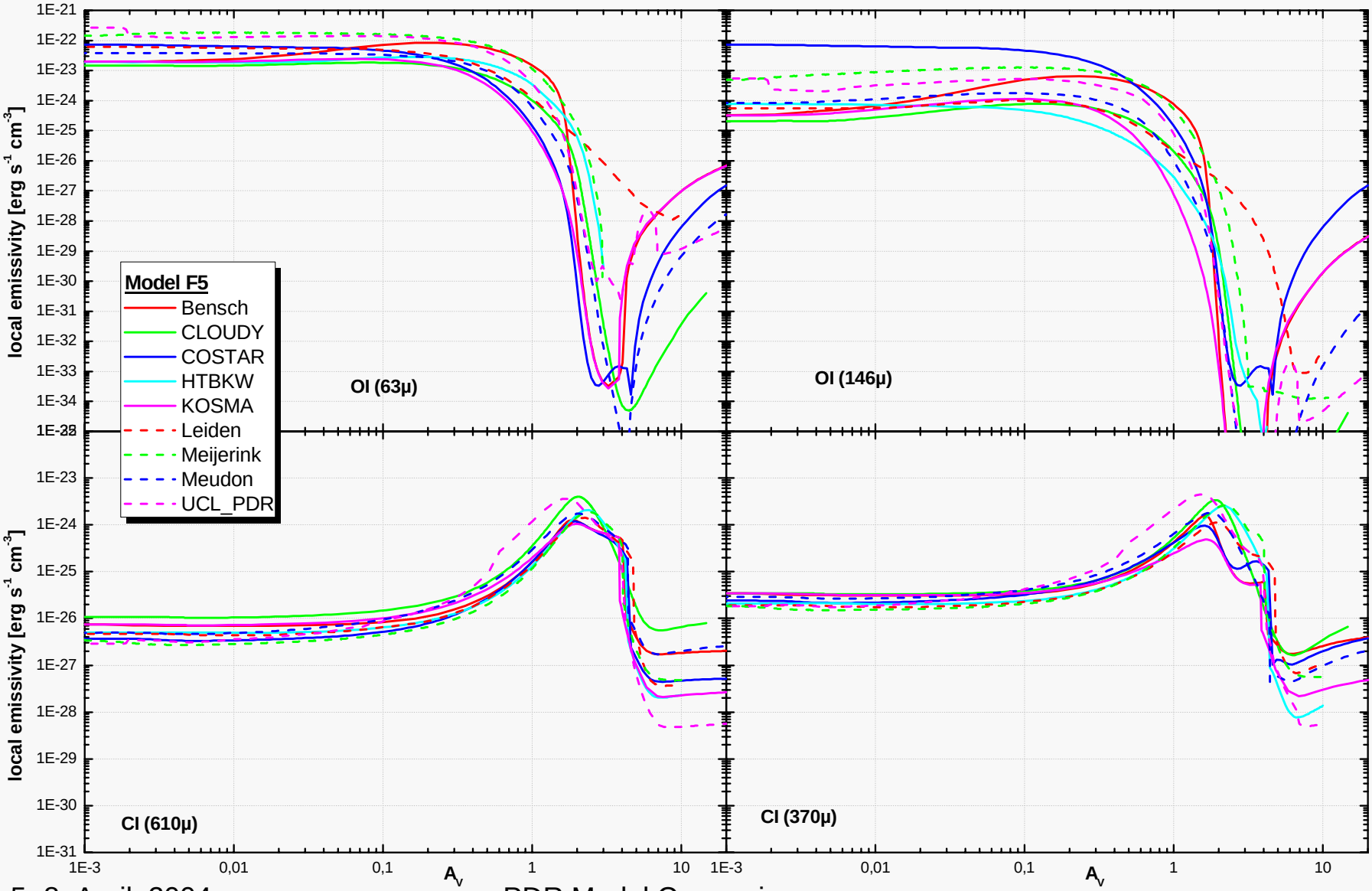
OI an CI cooling lines - n=10^3 cm^{-3}, χ=10



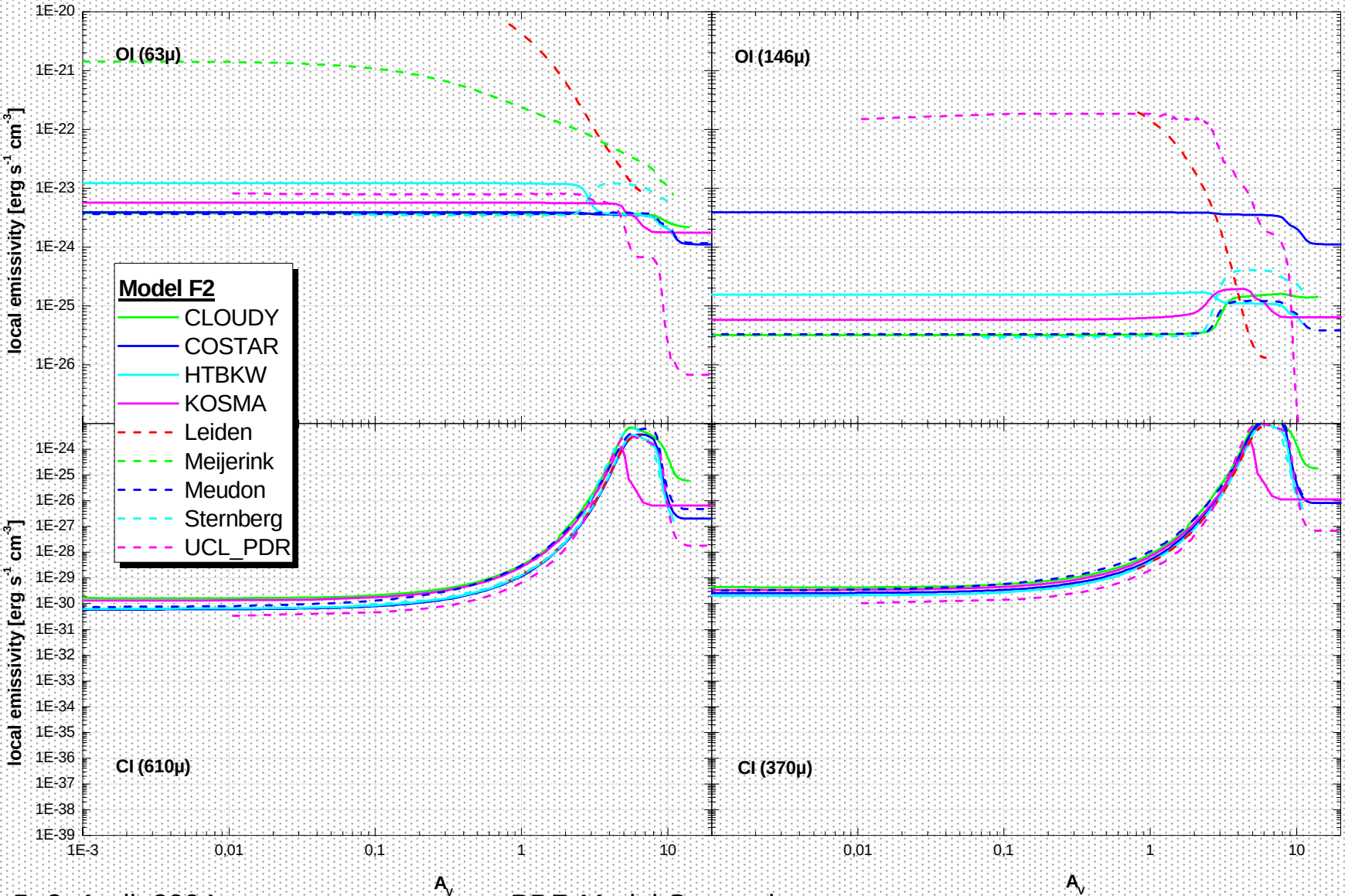
OI and CI cooling lines - n=10^3 cm^{-3}, χ=10^1, variable T



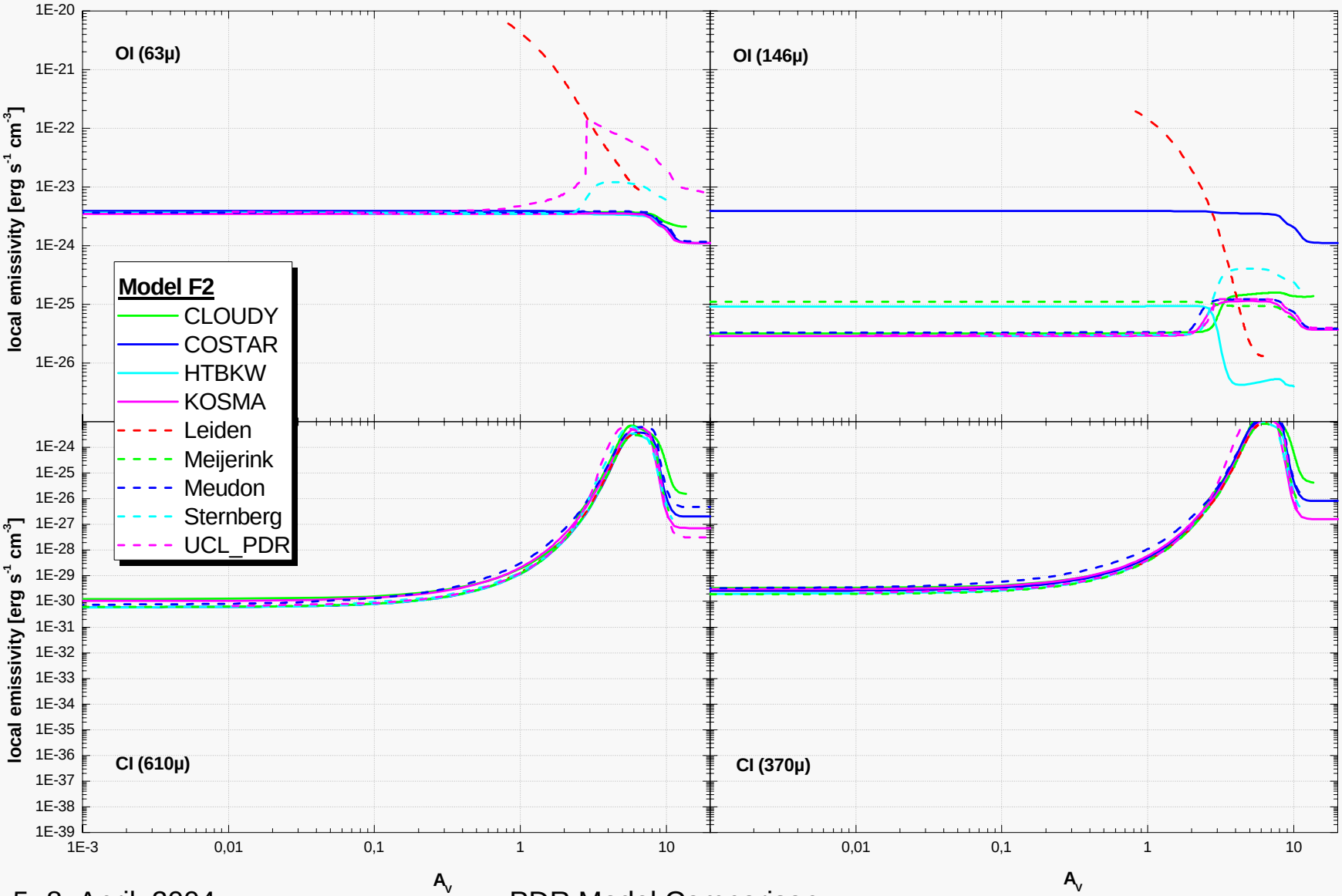
OI and CI cooling lines - n=10^3 cm^{-3}, χ=10^1, variable T

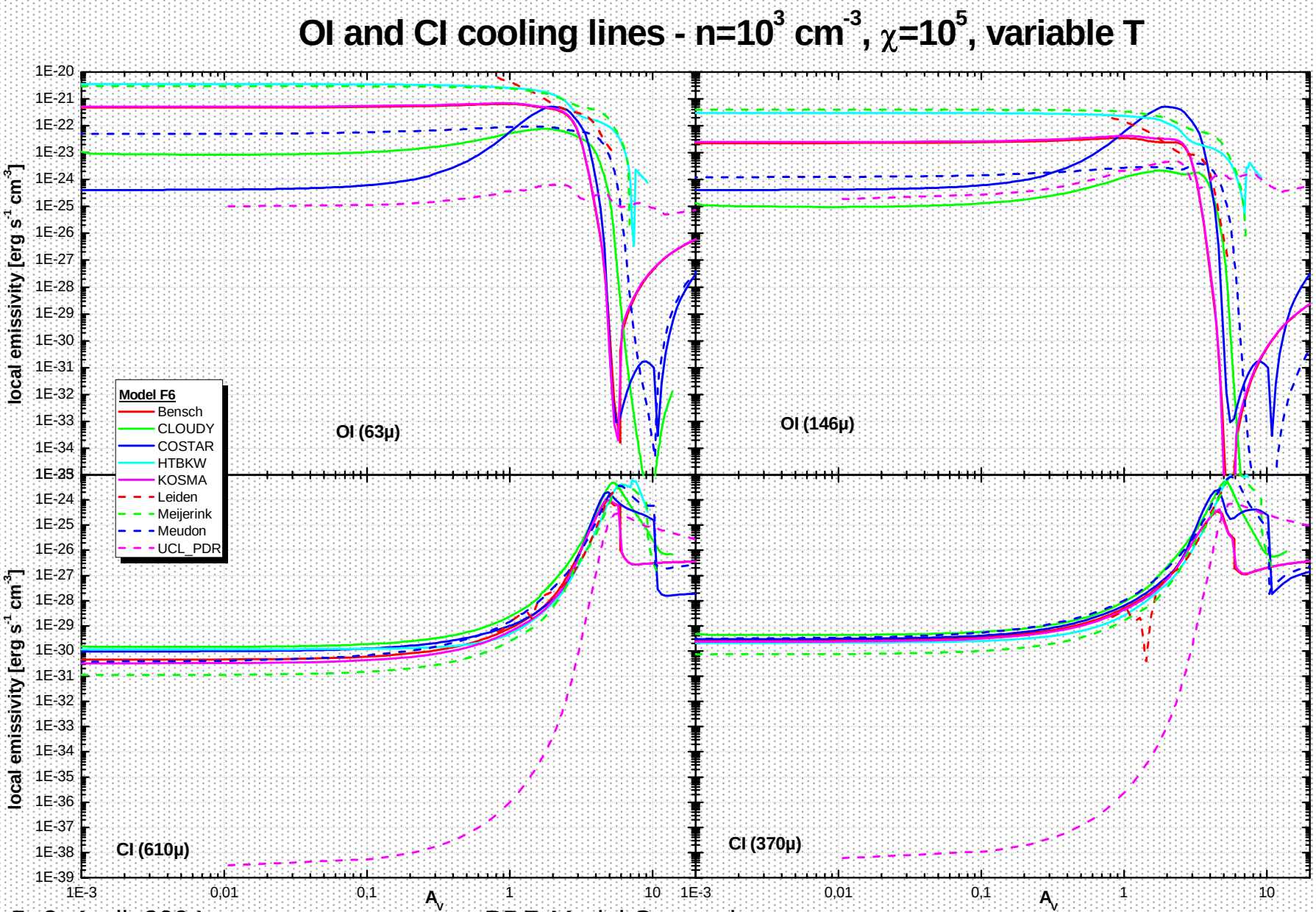


OI an CI cooling lines - n=10^3 cm^{-3}, $\chi=10^5$

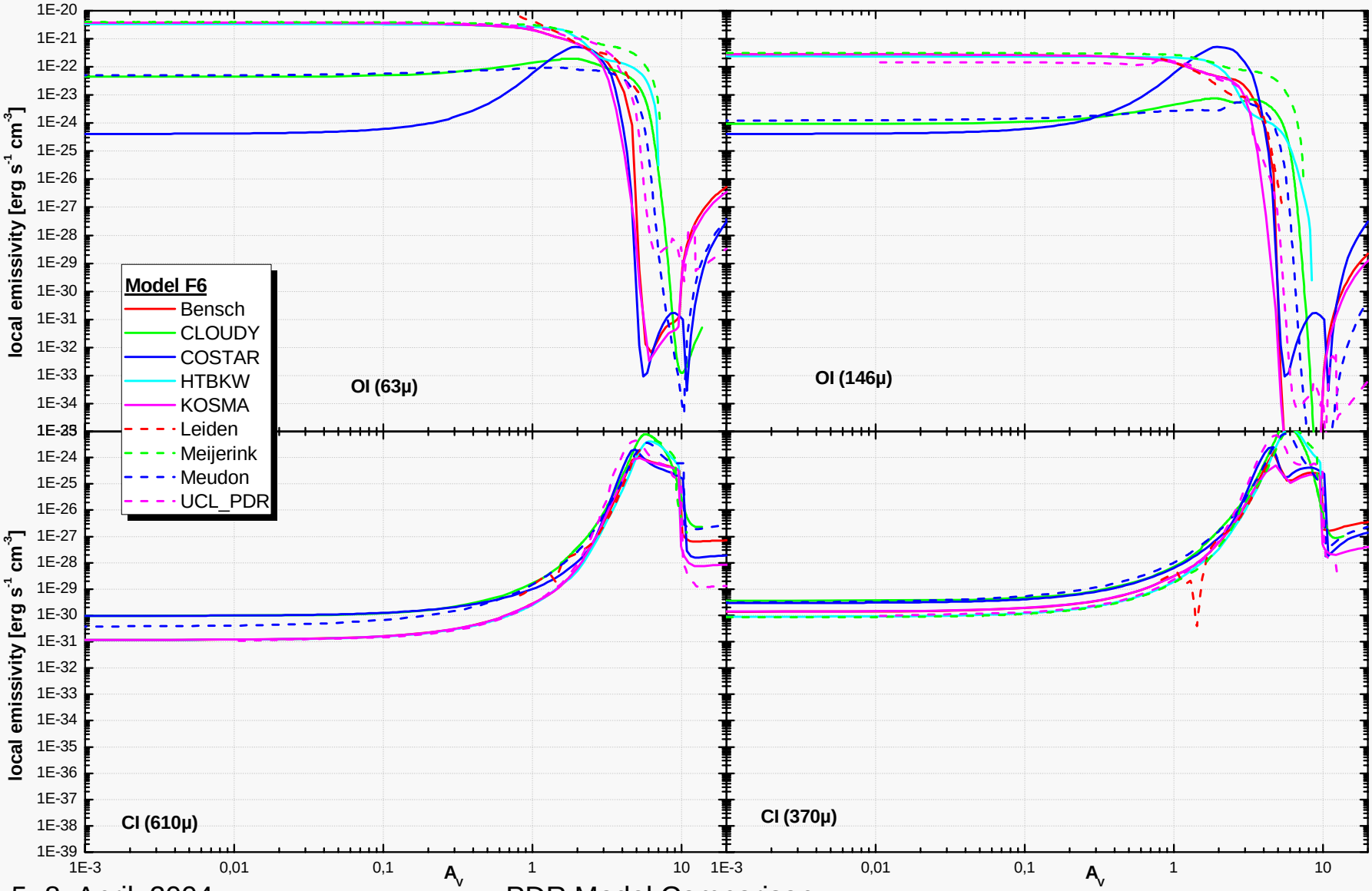


OI an CI cooling lines - n=10^3 cm^{-3}, $\chi=10^5$

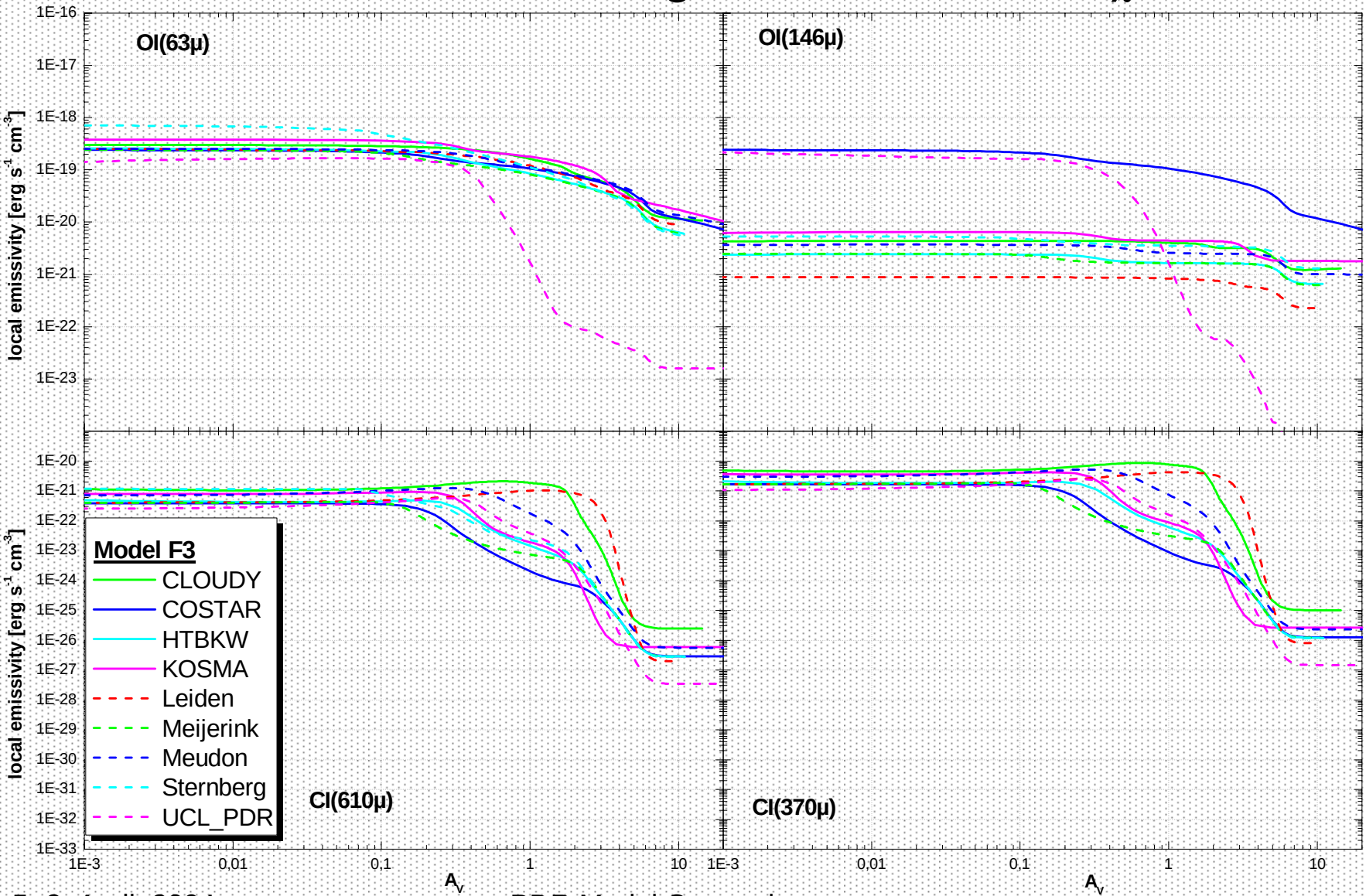



OI and CI cooling lines - n=10^3 cm^-3, χ=10^5, variable T
local emissivity [erg s^-1 cm^-3]
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
OI (63μ)
OI (146μ)
CI (610μ)
CI (370μ)
A_V
1E-3
0,01
0,1
1
10

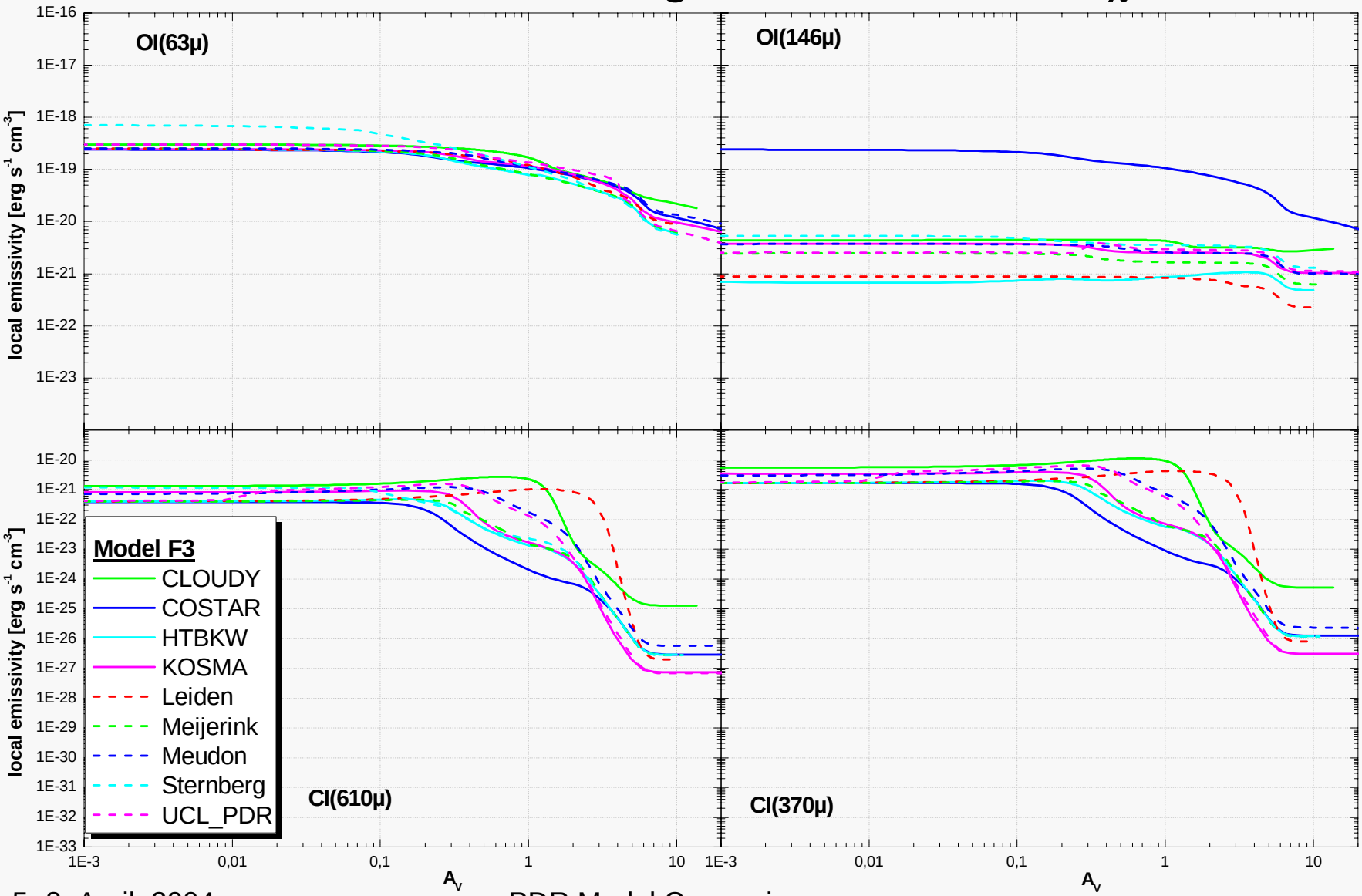
OI and CI cooling lines - n=10^3 cm^{-3}, χ=10^5, variable T



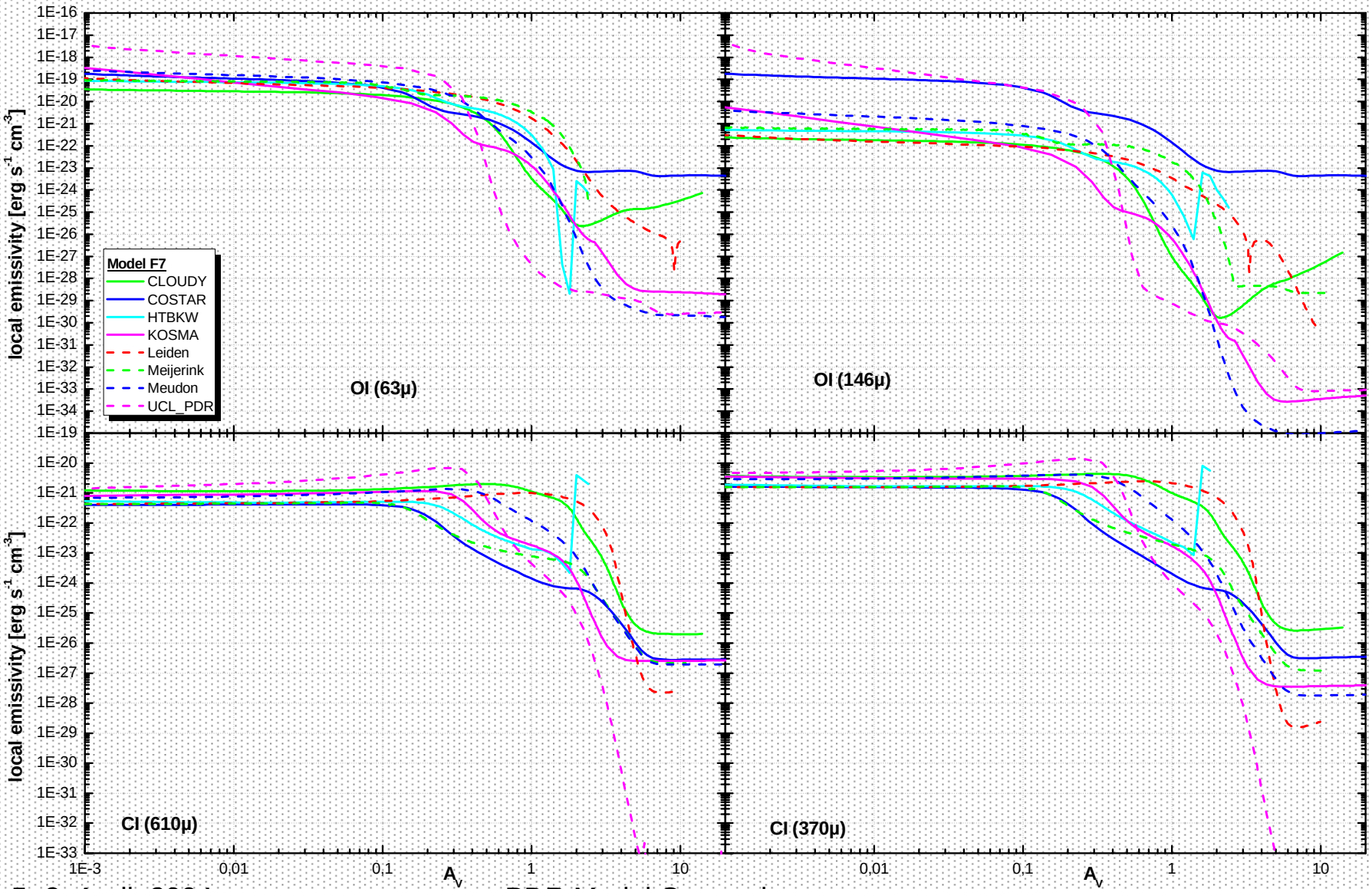
OI and CI cooling lines - $n=10^{5.5}$ cm^{-3}, $\chi=10$



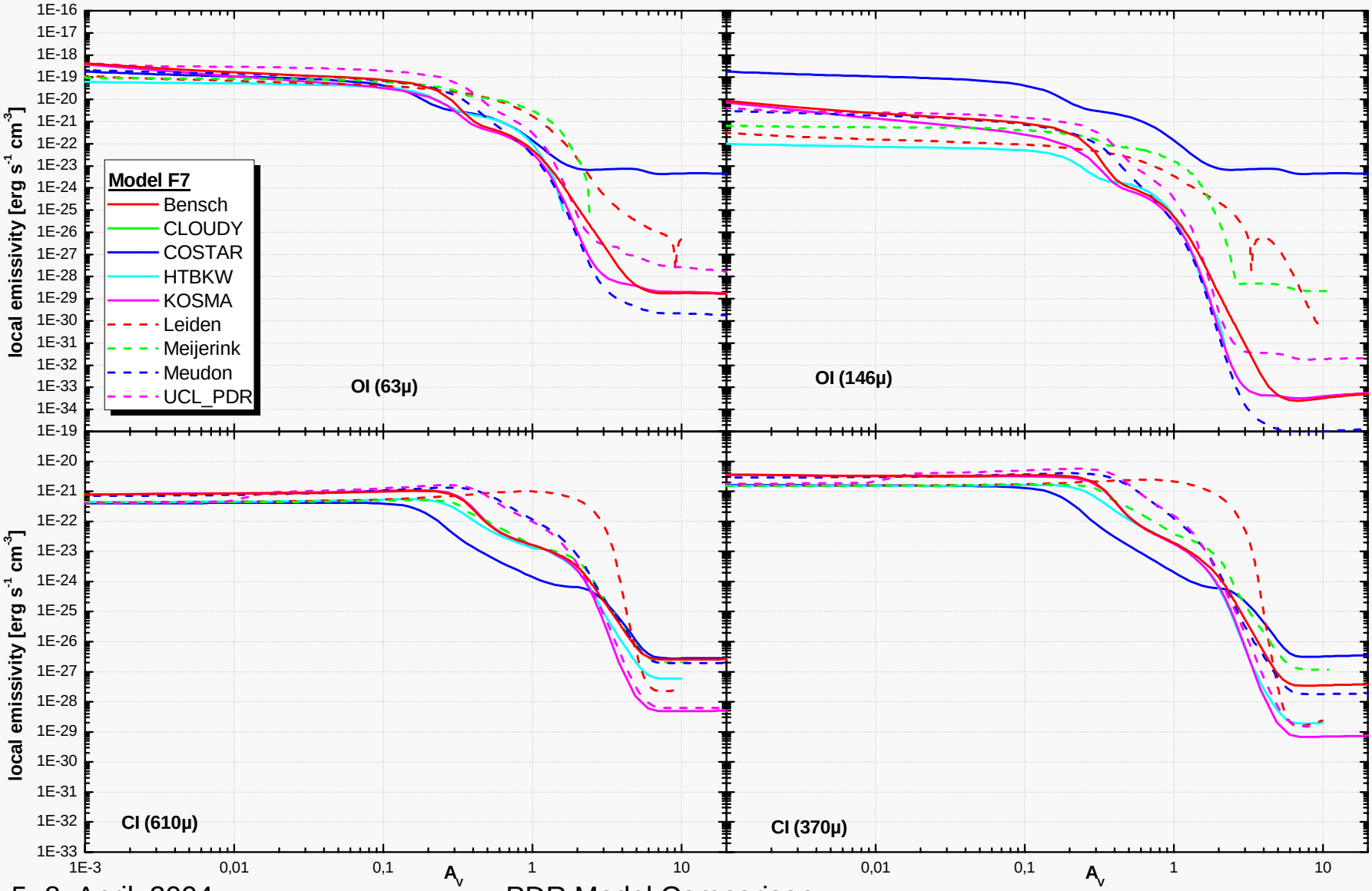
OI and CI cooling lines - $n=10^{5.5}$ cm^{-3}, $\chi=10$



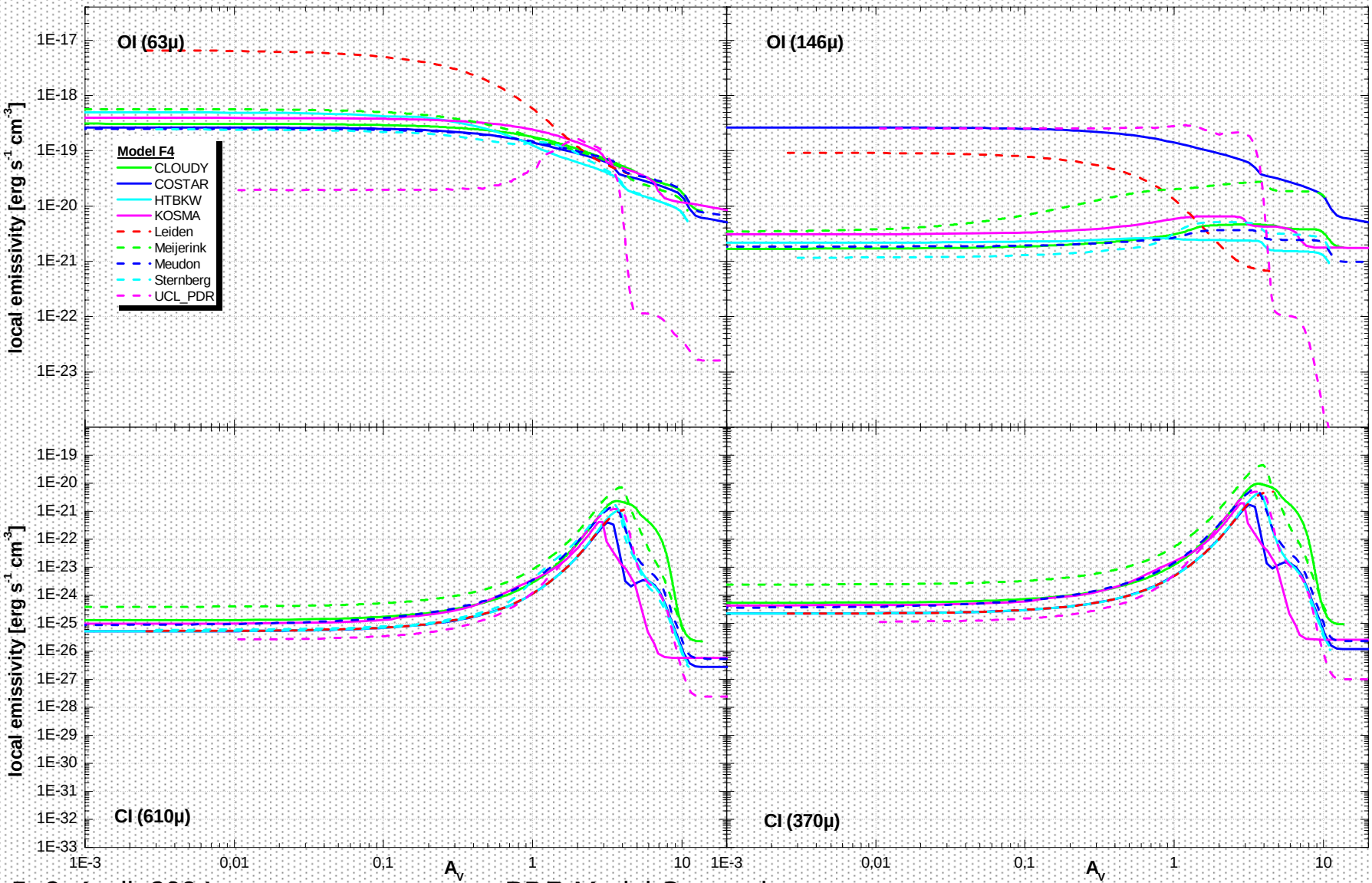
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^{1}$, variable T



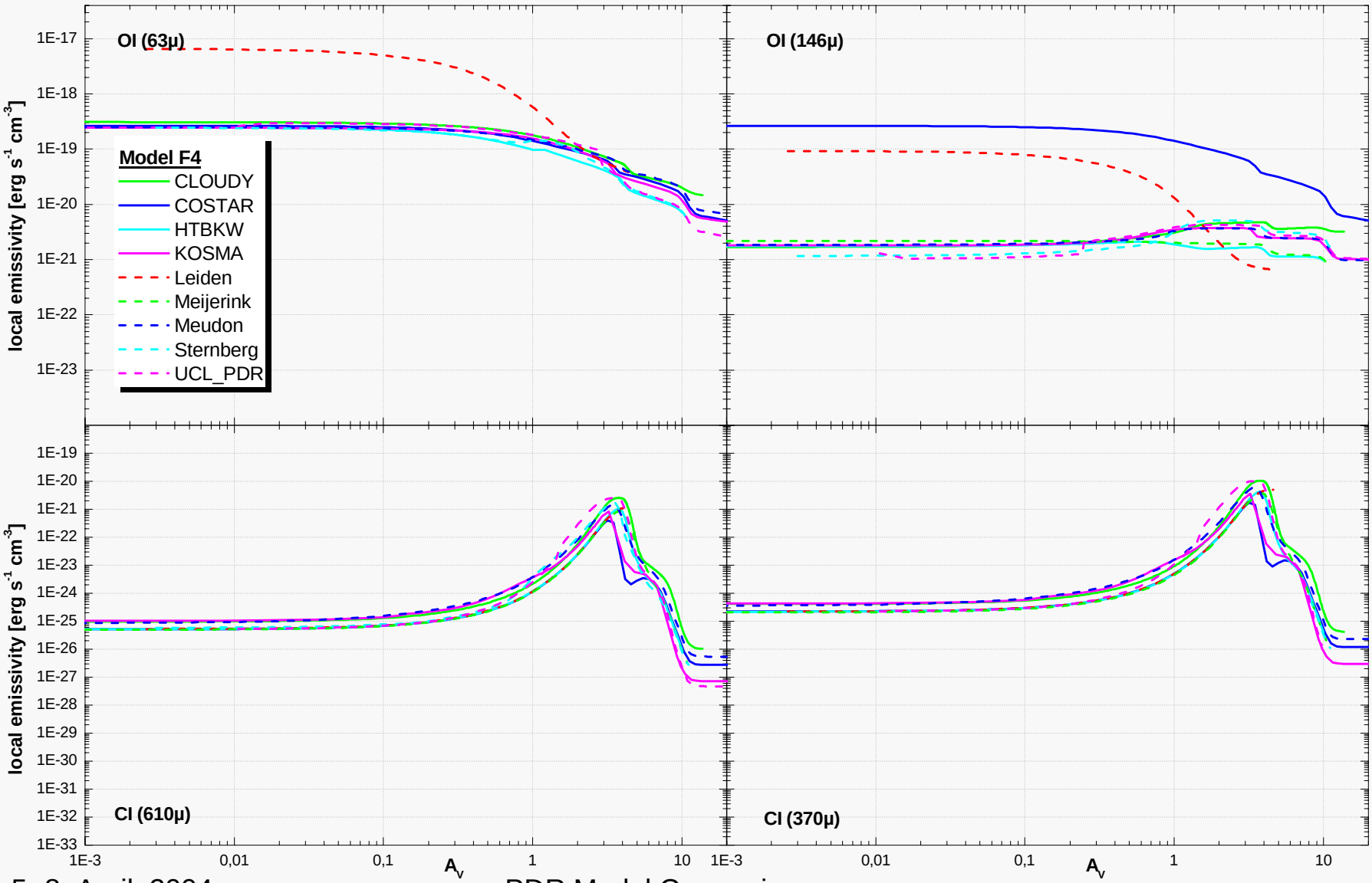
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^{1}$, variable T



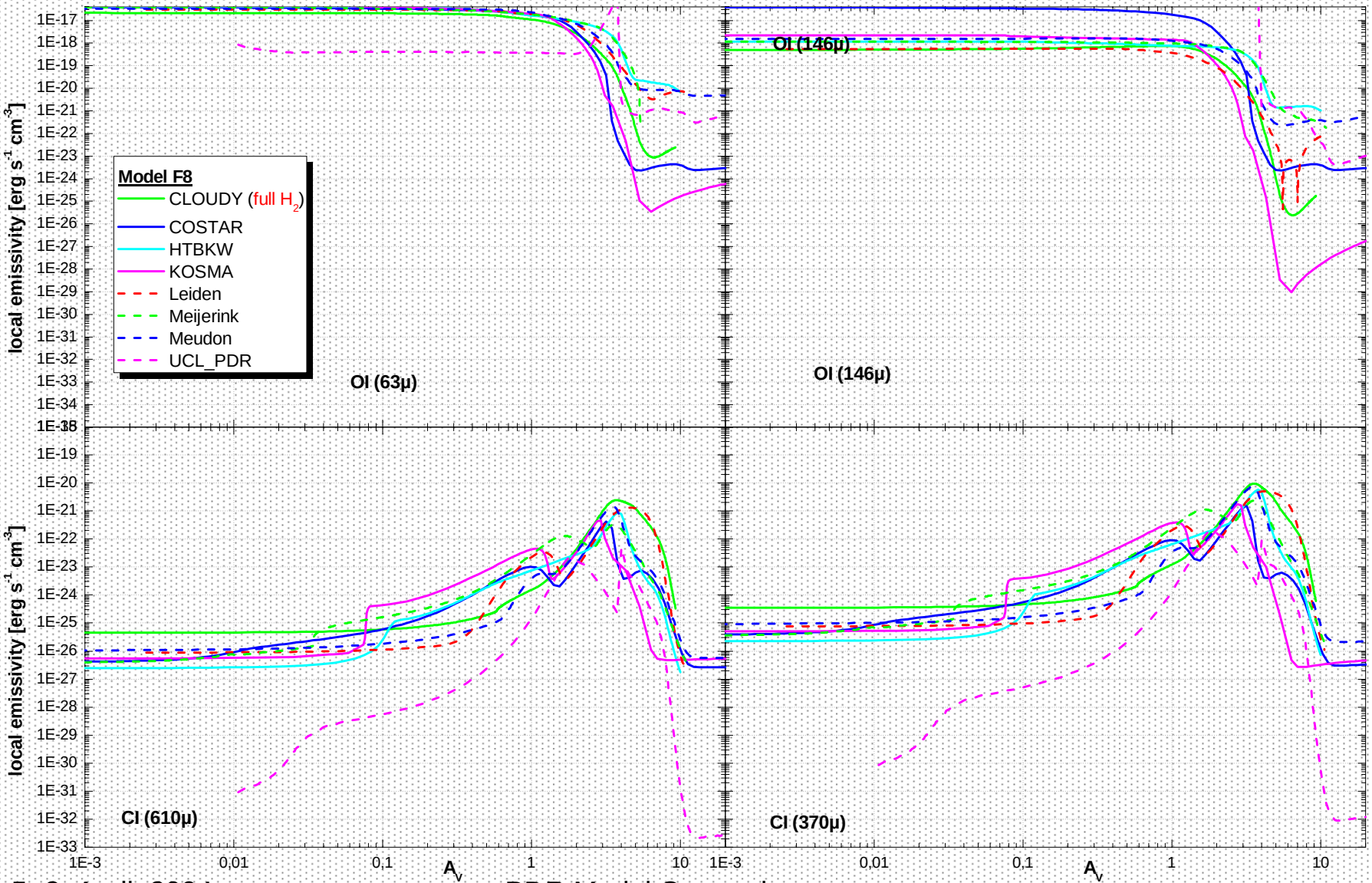
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^5$



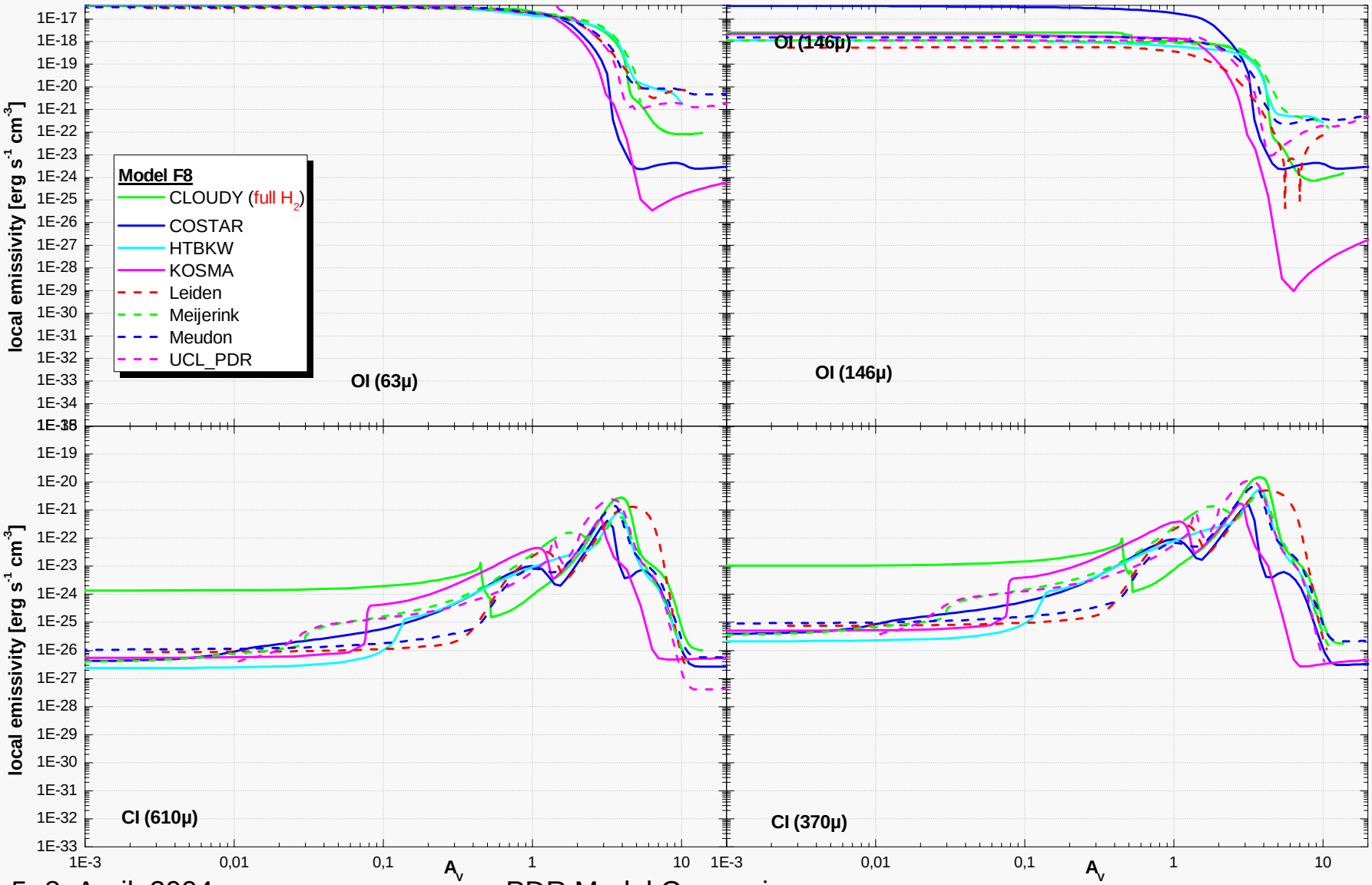
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^5$

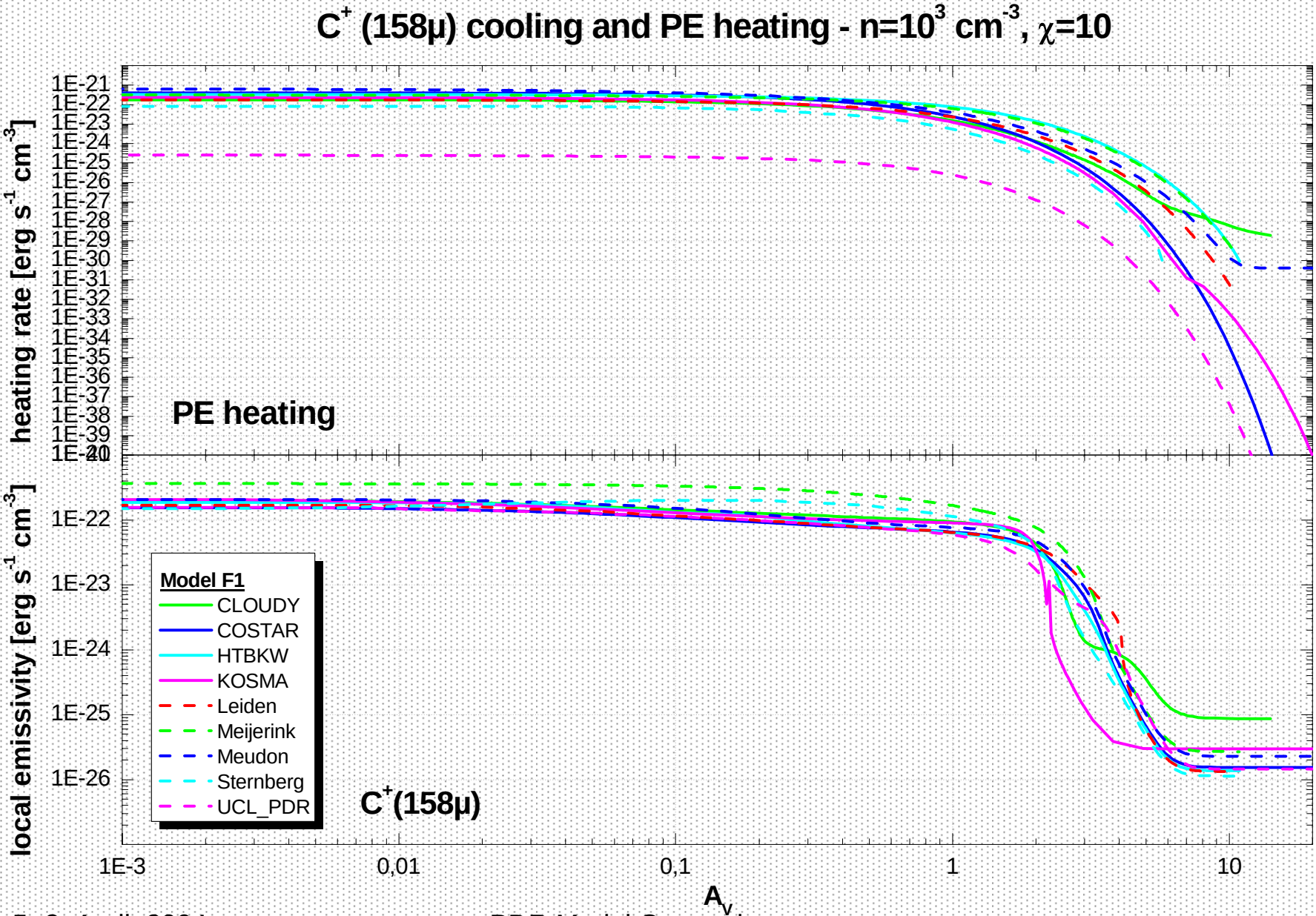


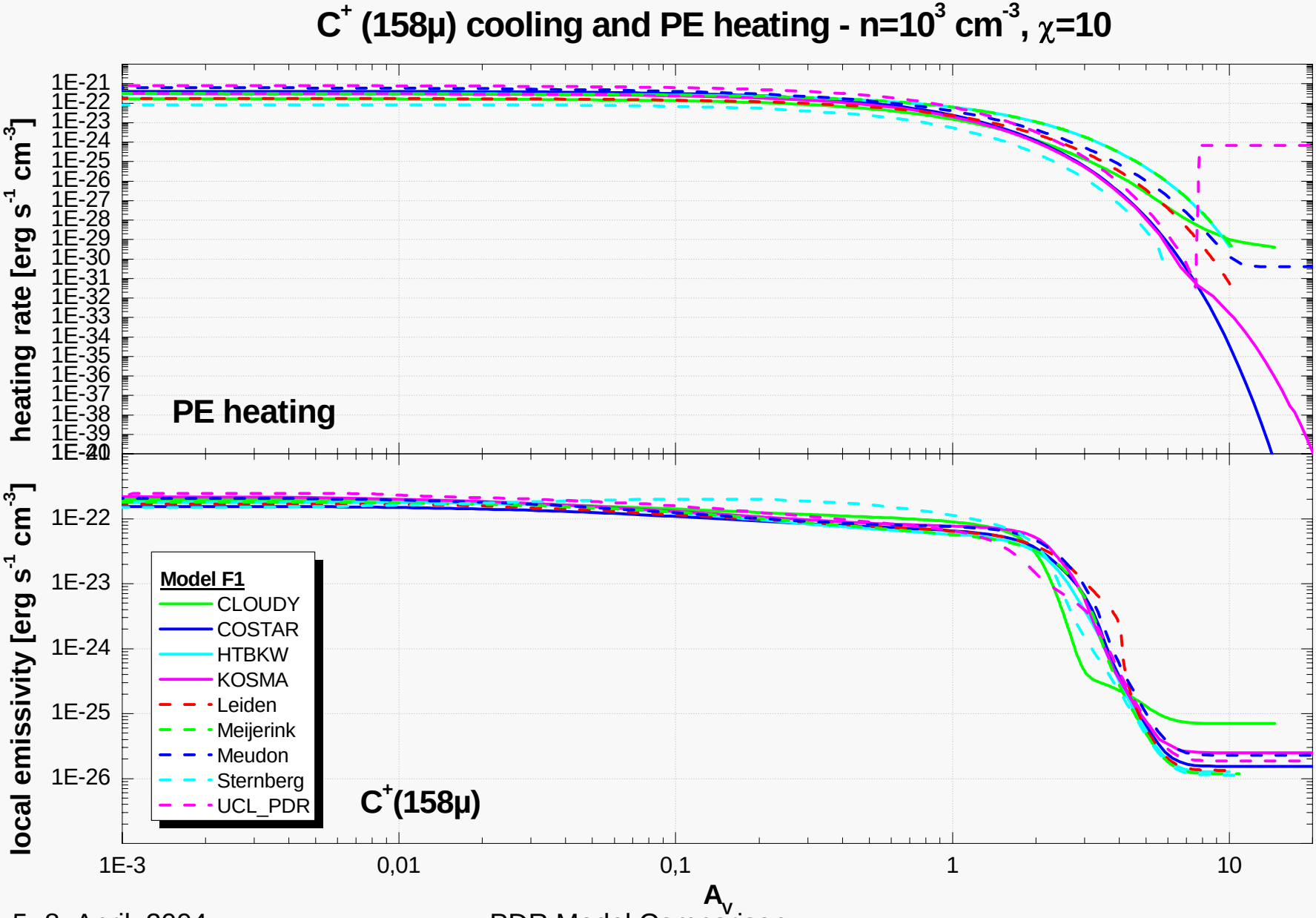
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^5$, variable T

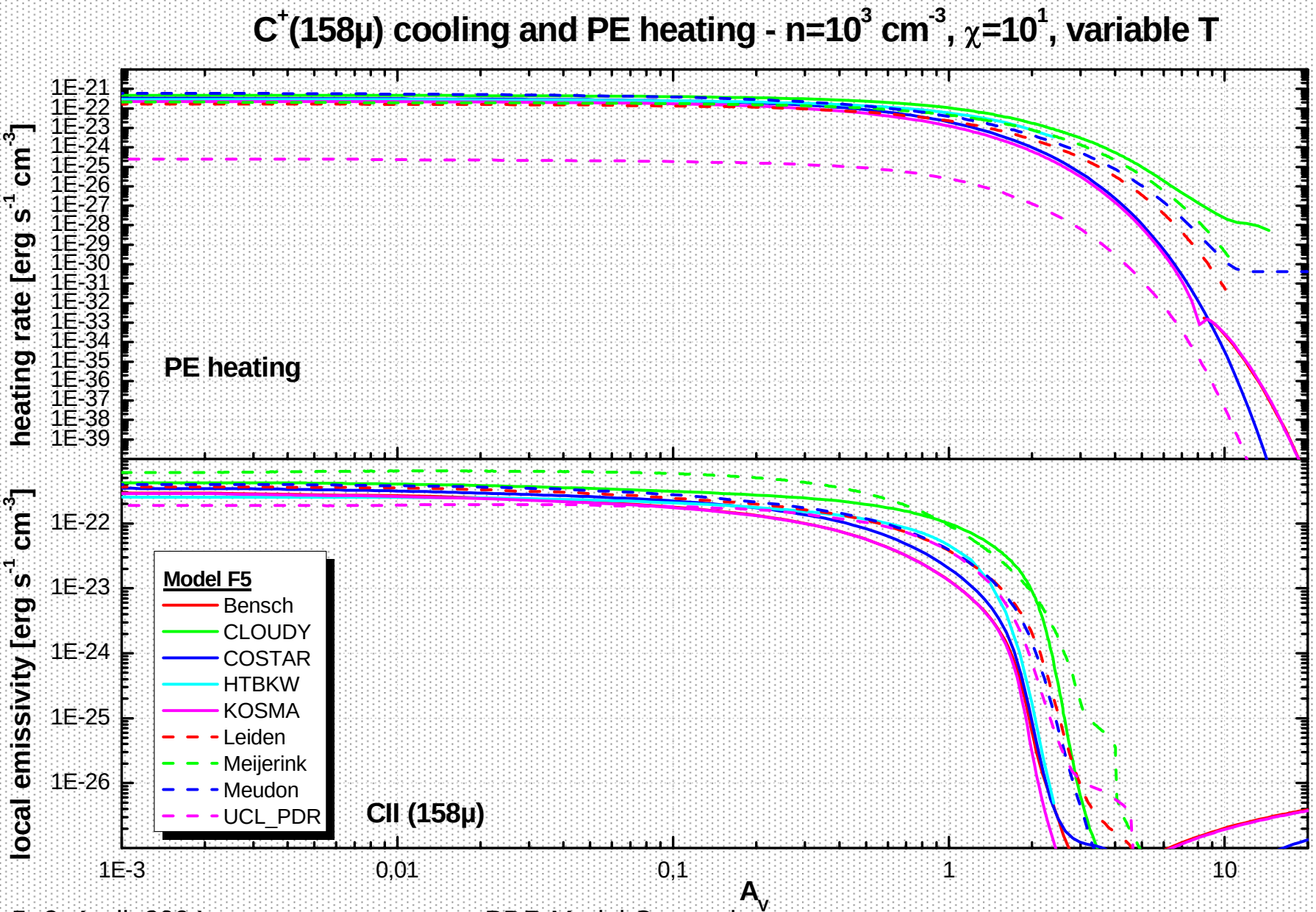


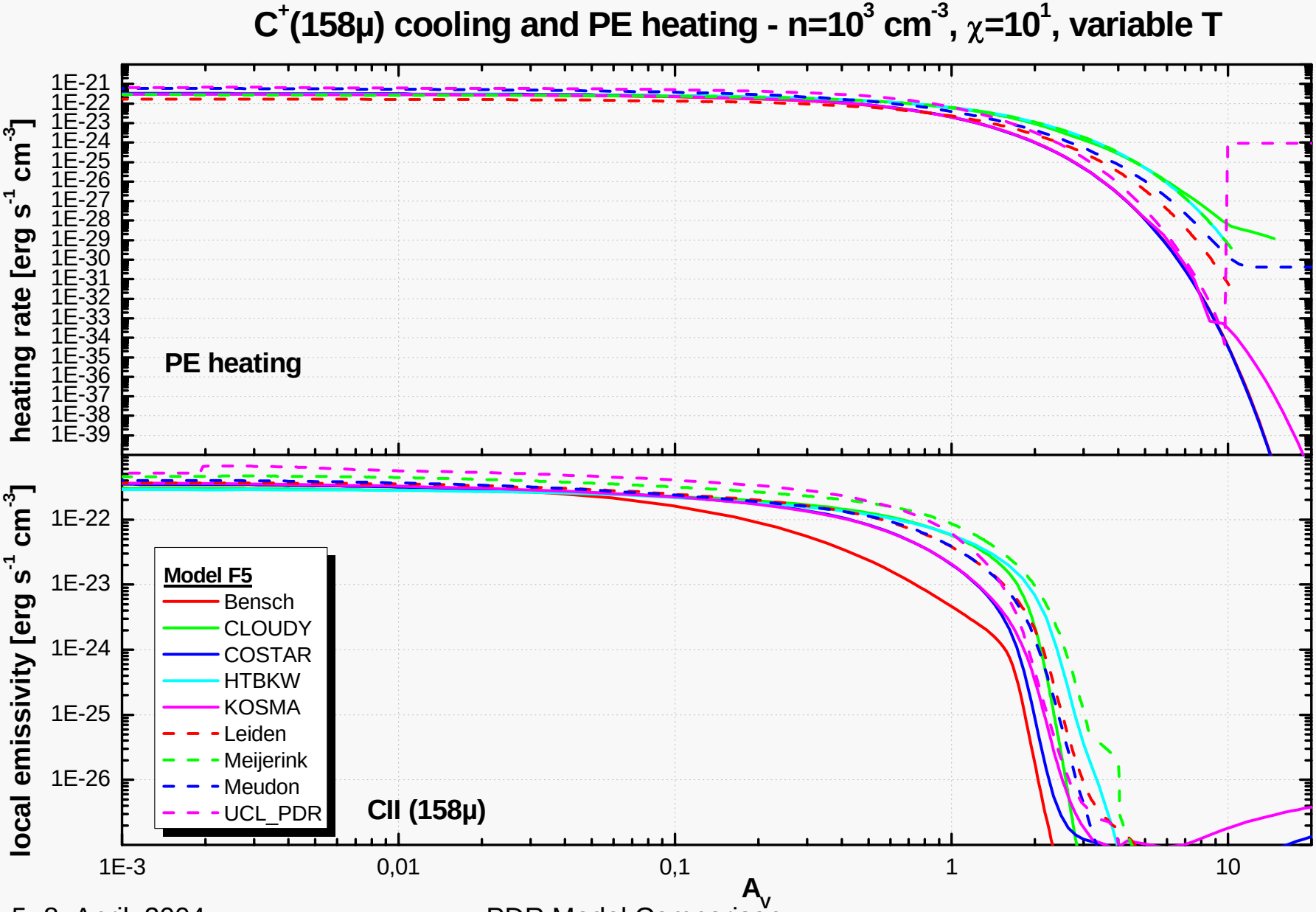
OI and CI cooling lines - n=$10^{5.5}$ cm^{-3}, $\chi=10^5$, variable T

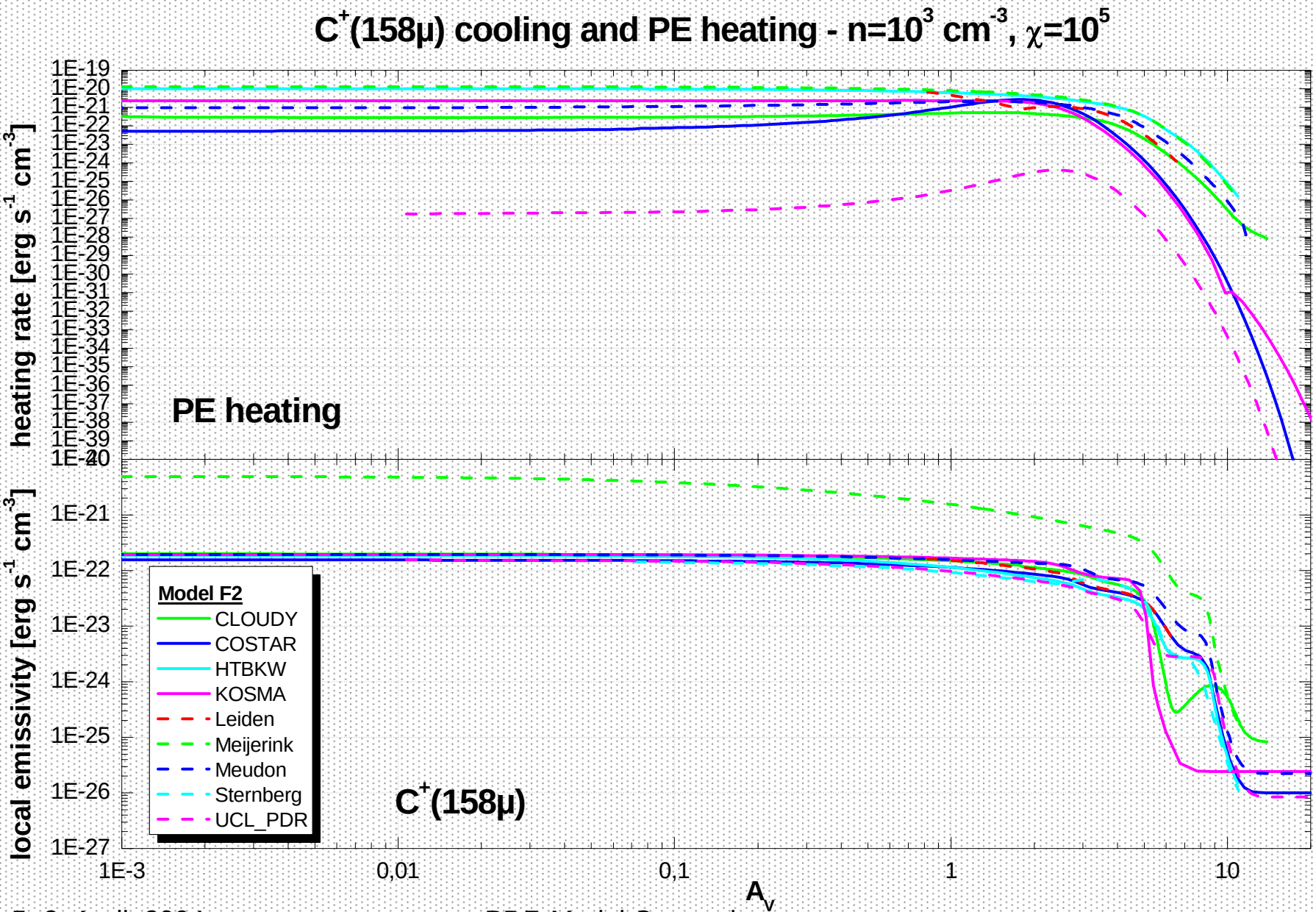


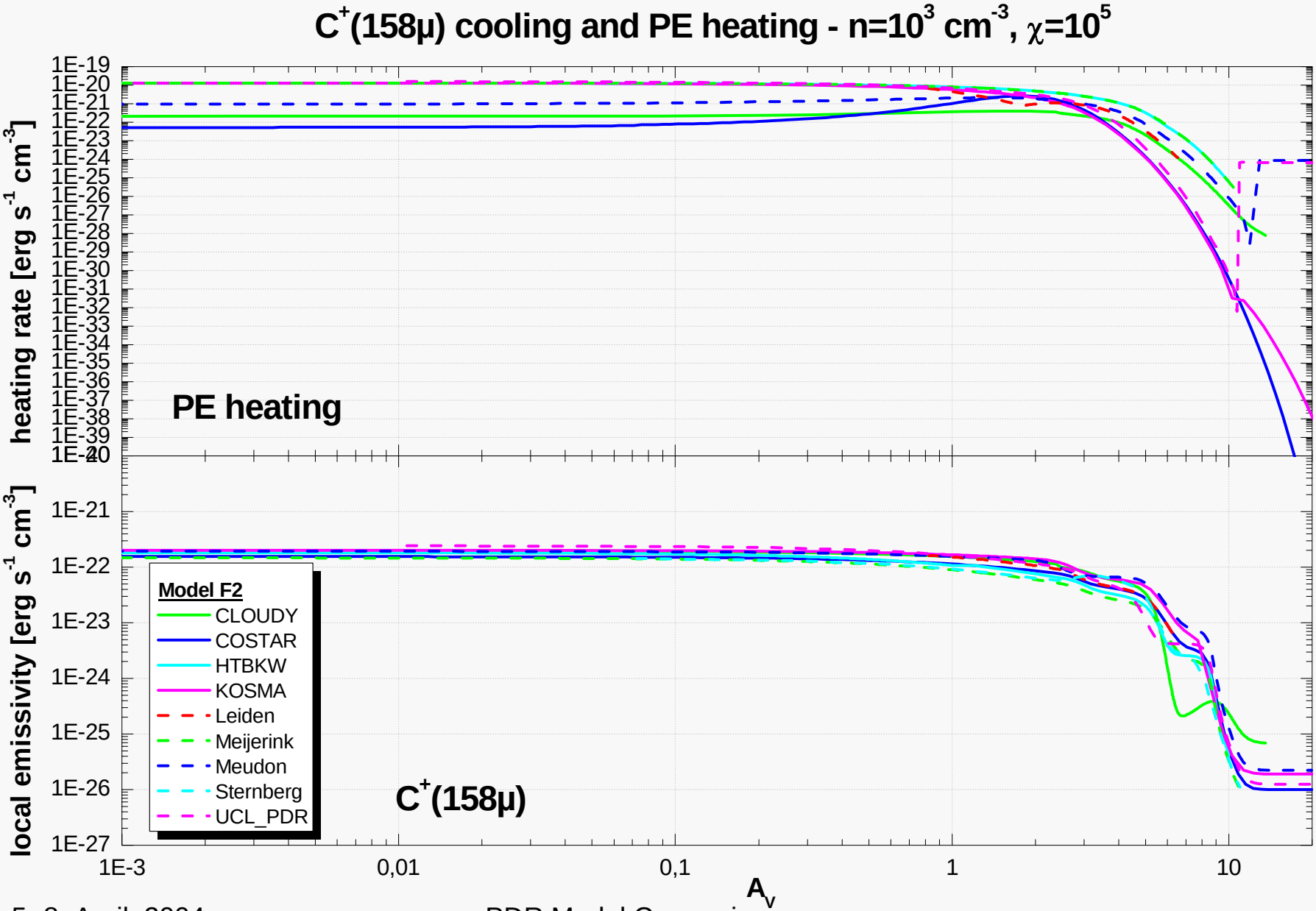

C+ (158µ) cooling and PE heating - n=10^3 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F1
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

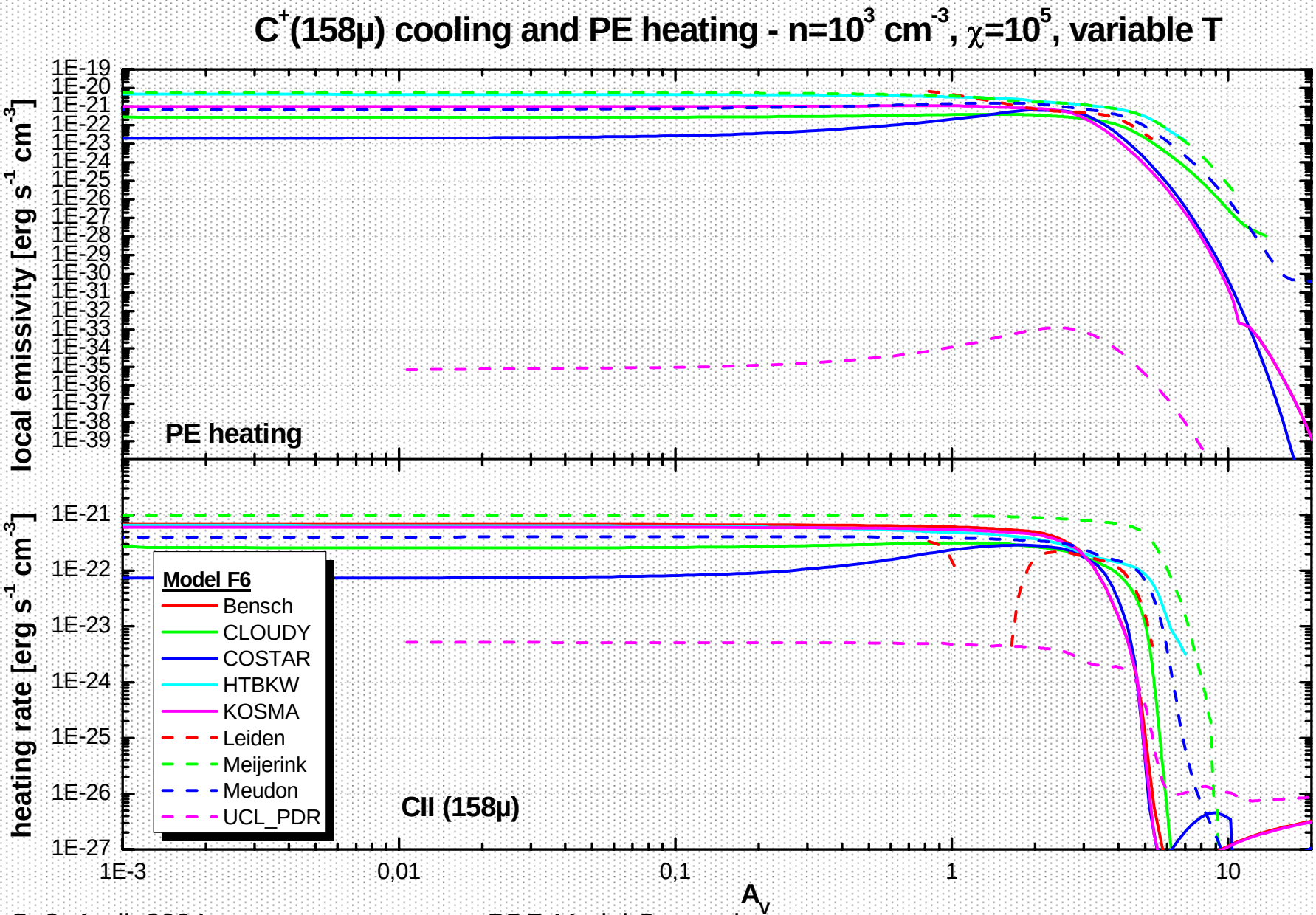

C+ (158µ) cooling and PE heating - n=10^3 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F1
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

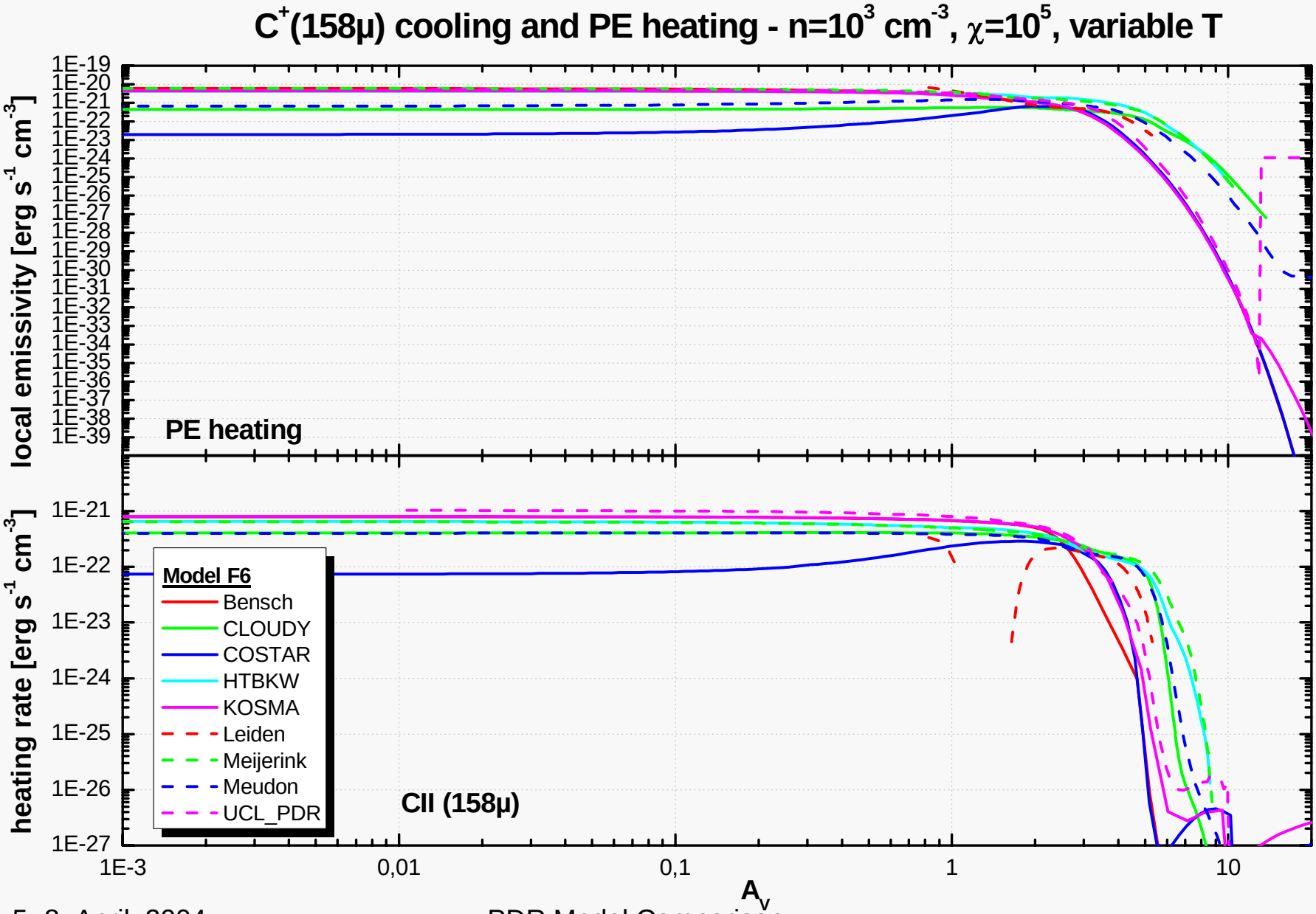

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
CII (158µ)
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
A_V

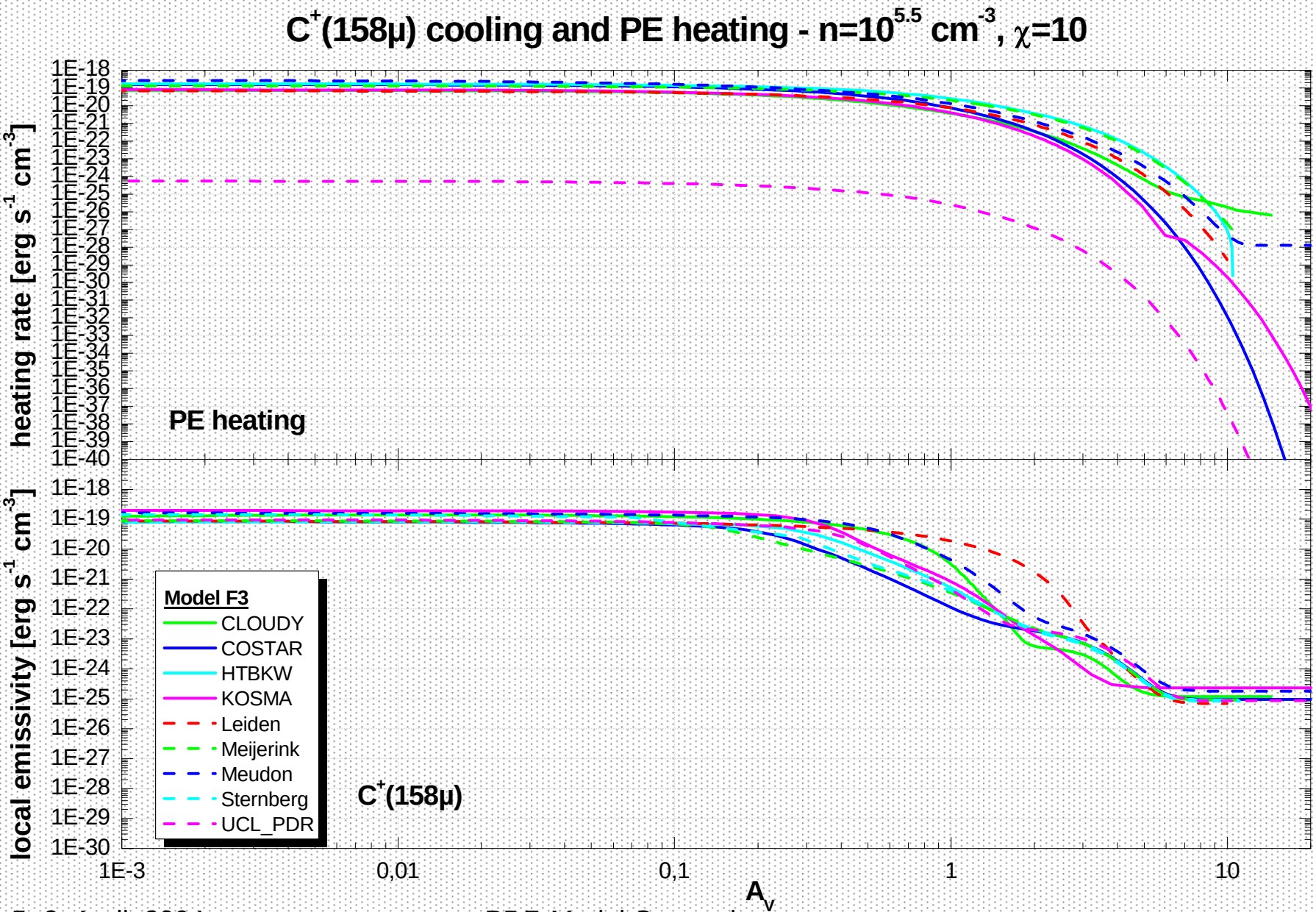

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
CII (158µ)
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
A_V
1E-3
0,01
0,1
1
10

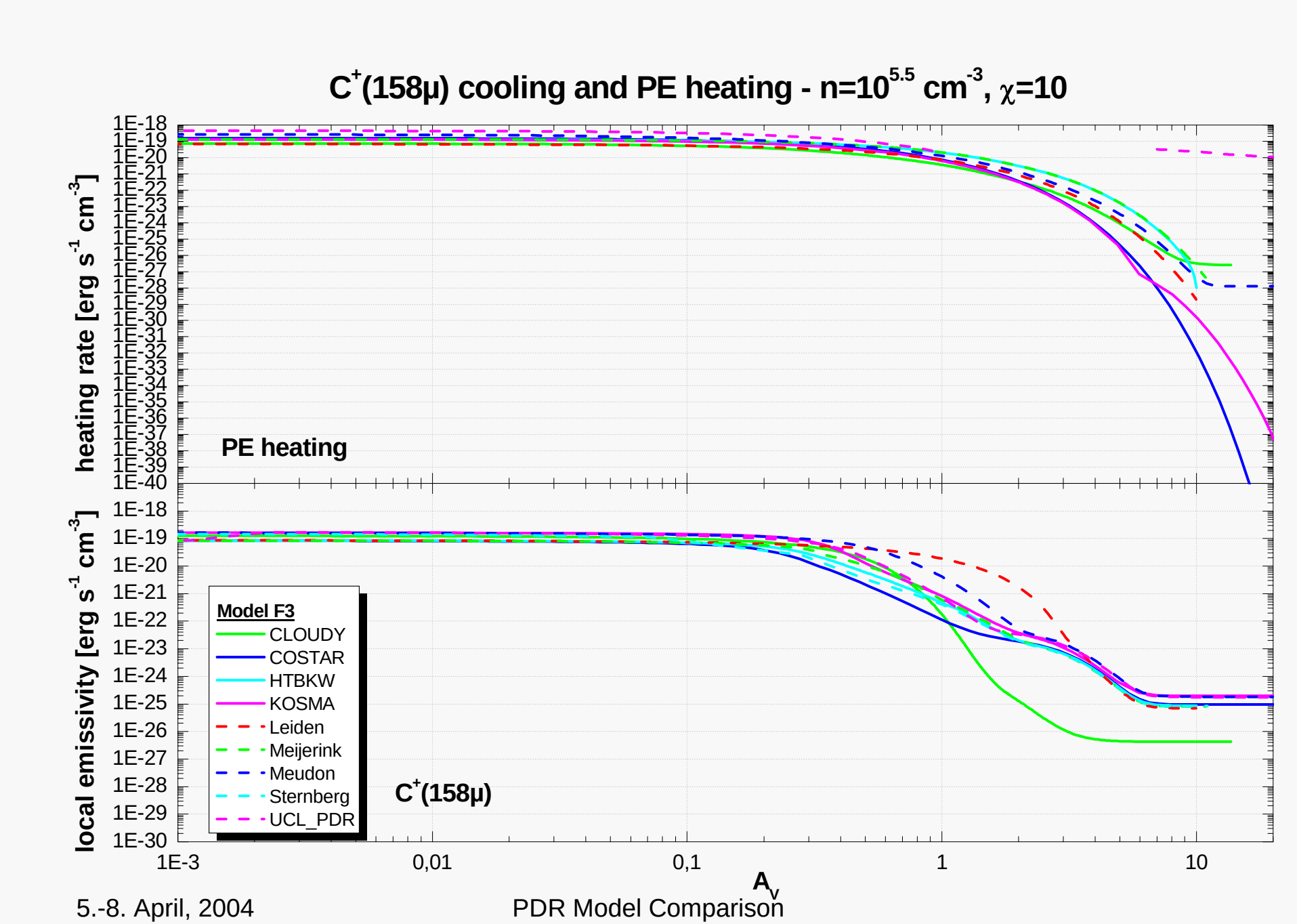

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^5
PE heating
heating rate [erg s^-1 cm^-3]
C+(158µ)
local emissivity [erg s^-1 cm^-3]
Model F2
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
1E-33
1E-34
1E-35
1E-36
1E-37
1E-38
1E-39
1E-40
1E-3
0,01
0,1
1
10
A_V

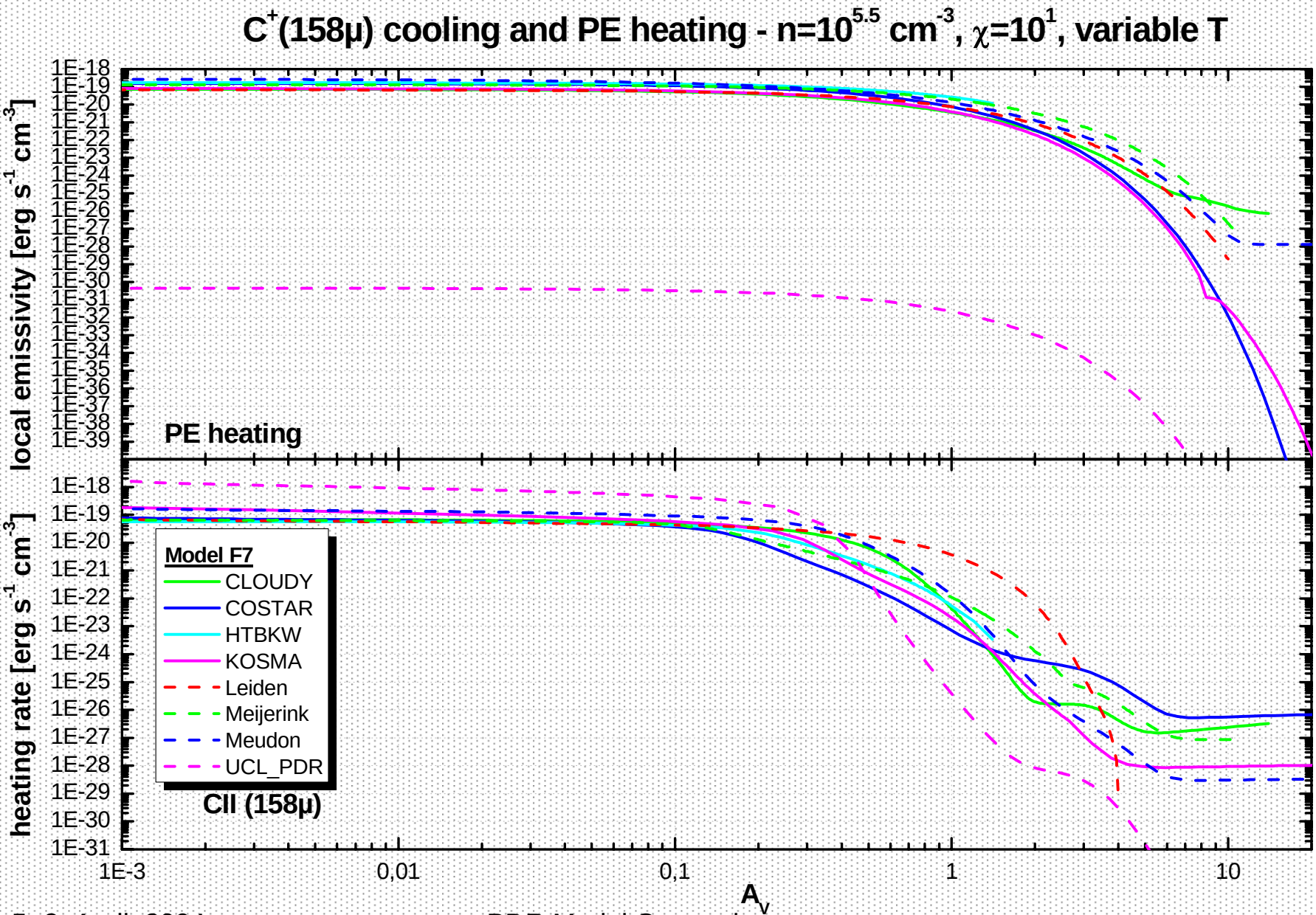

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F2
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

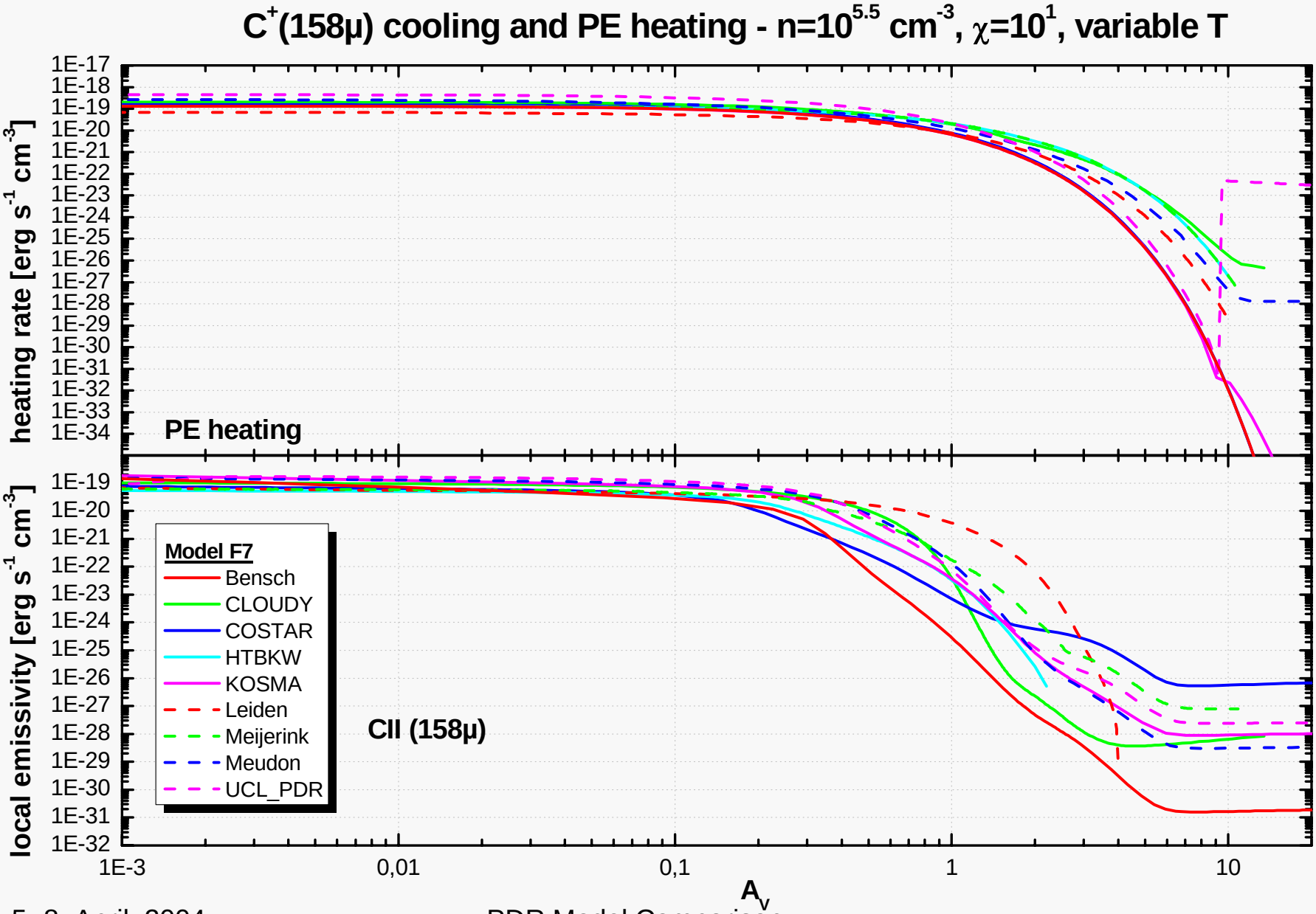

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^5, variable T
local emissivity [erg s^-1 cm^-3]
PE heating
heating rate [erg s^-1 cm^-3]
CII (158µ)
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

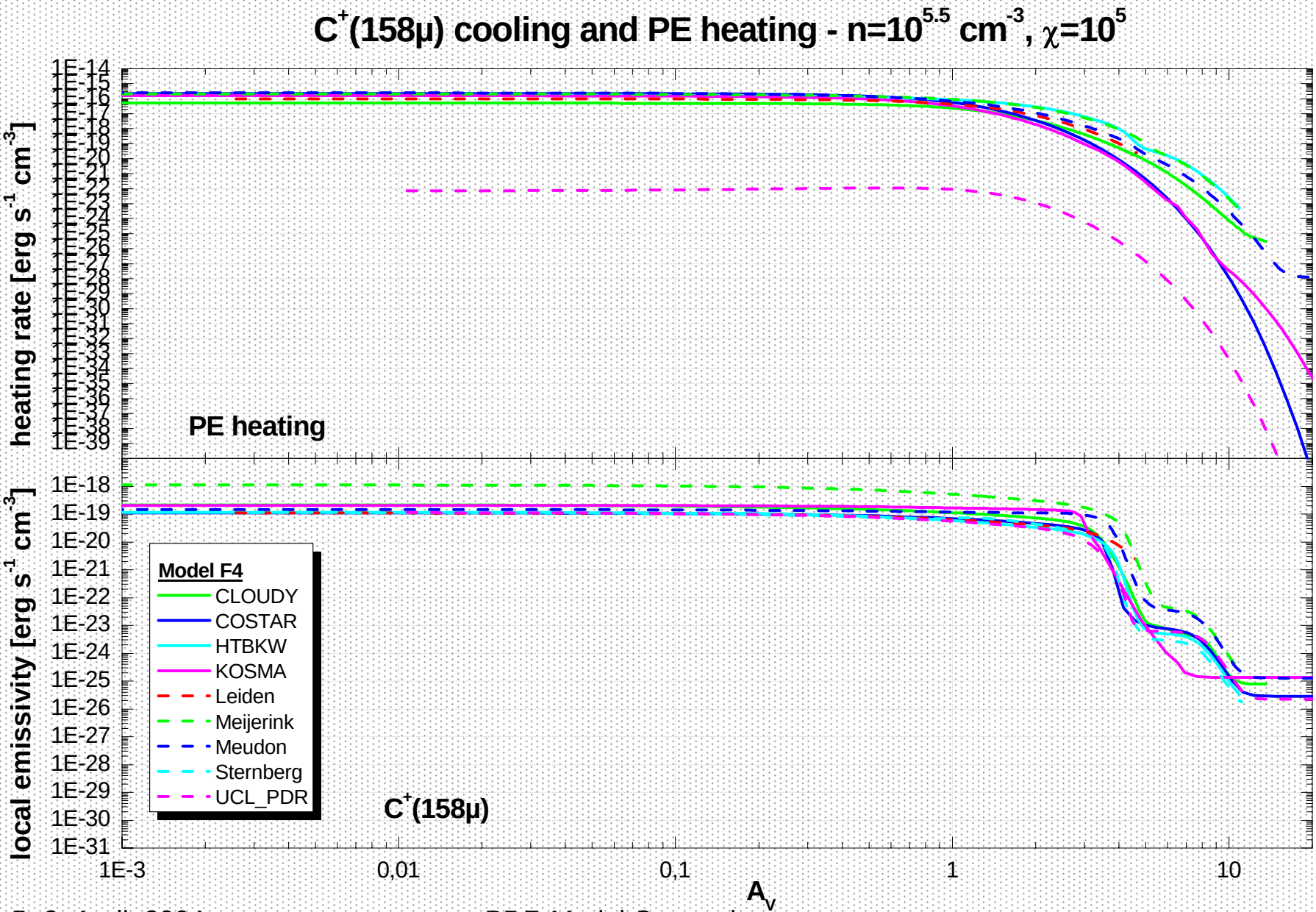

C+(158µ) cooling and PE heating - n=10^3 cm^-3, χ=10^5, variable T
local emissivity [erg s^-1 cm^-3]
PE heating
heating rate [erg s^-1 cm^-3]
CII (158µ)
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

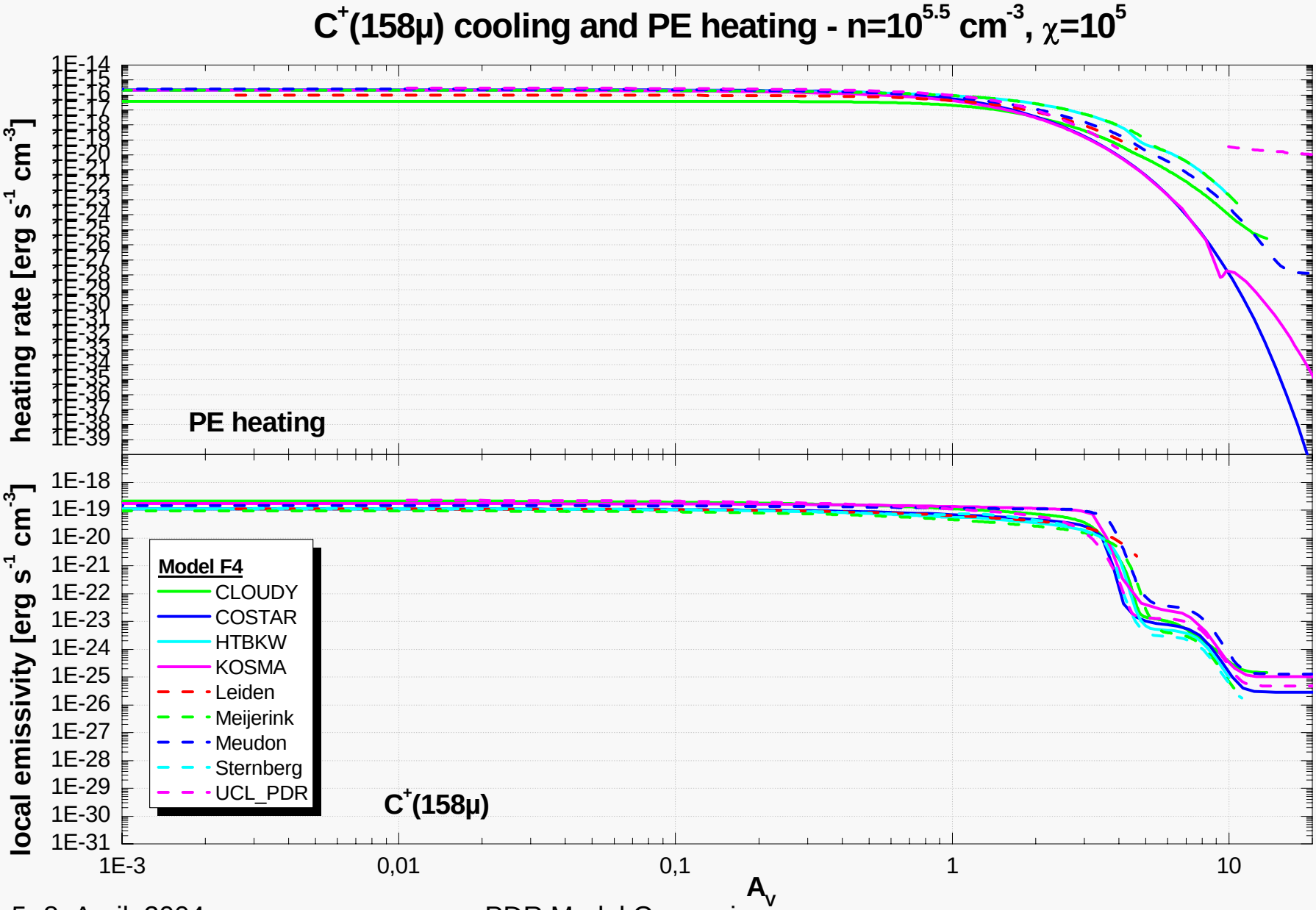

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
local emissivity [erg s^-1 cm^-3]
PE heating
C+(158µ)
Model F3
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

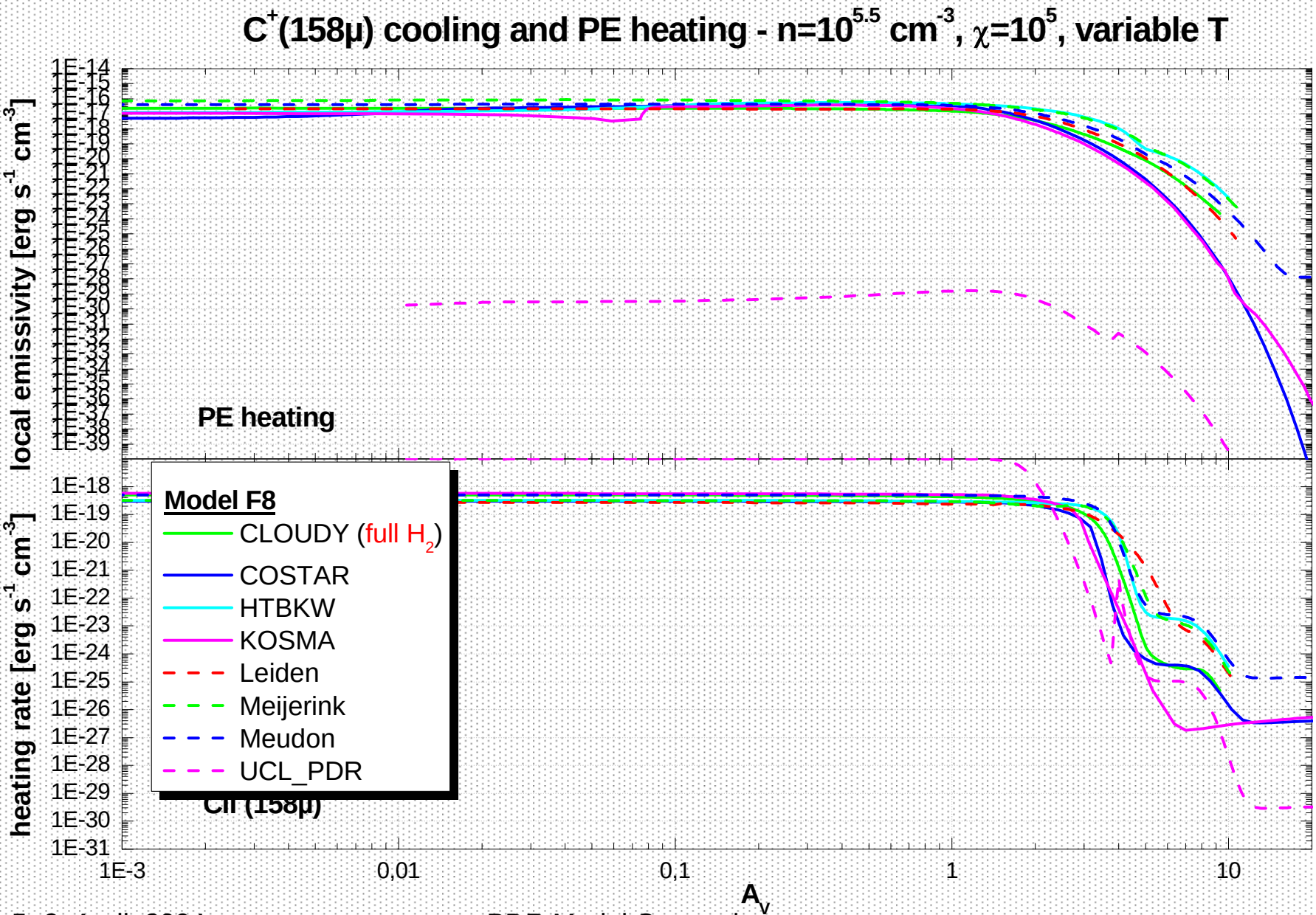

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F3
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

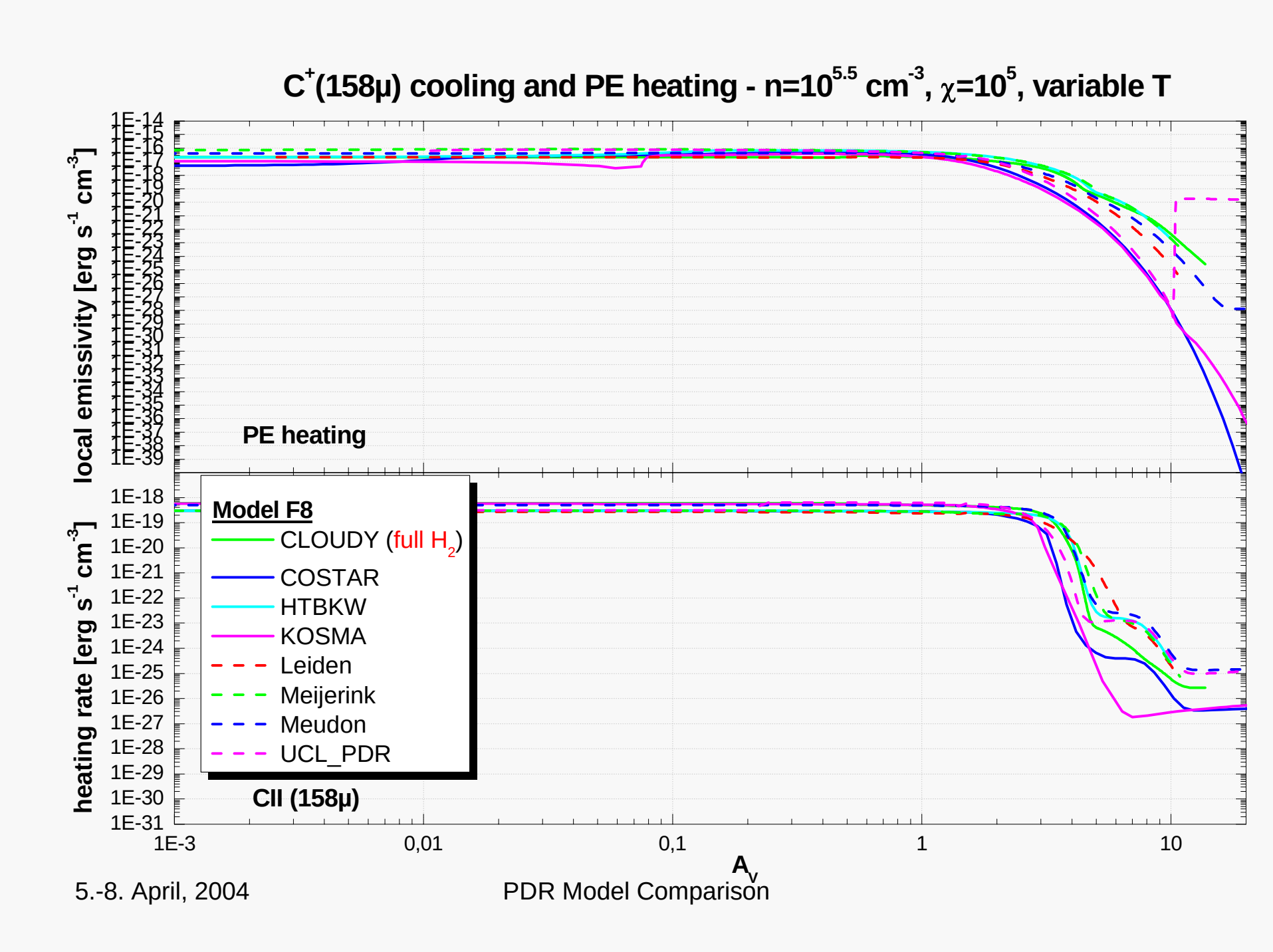

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^1, variable T
local emissivity [erg s^-1 cm^-3]
PE heating
heating rate [erg s^-1 cm^-3]
CII (158µ)
Model F7
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

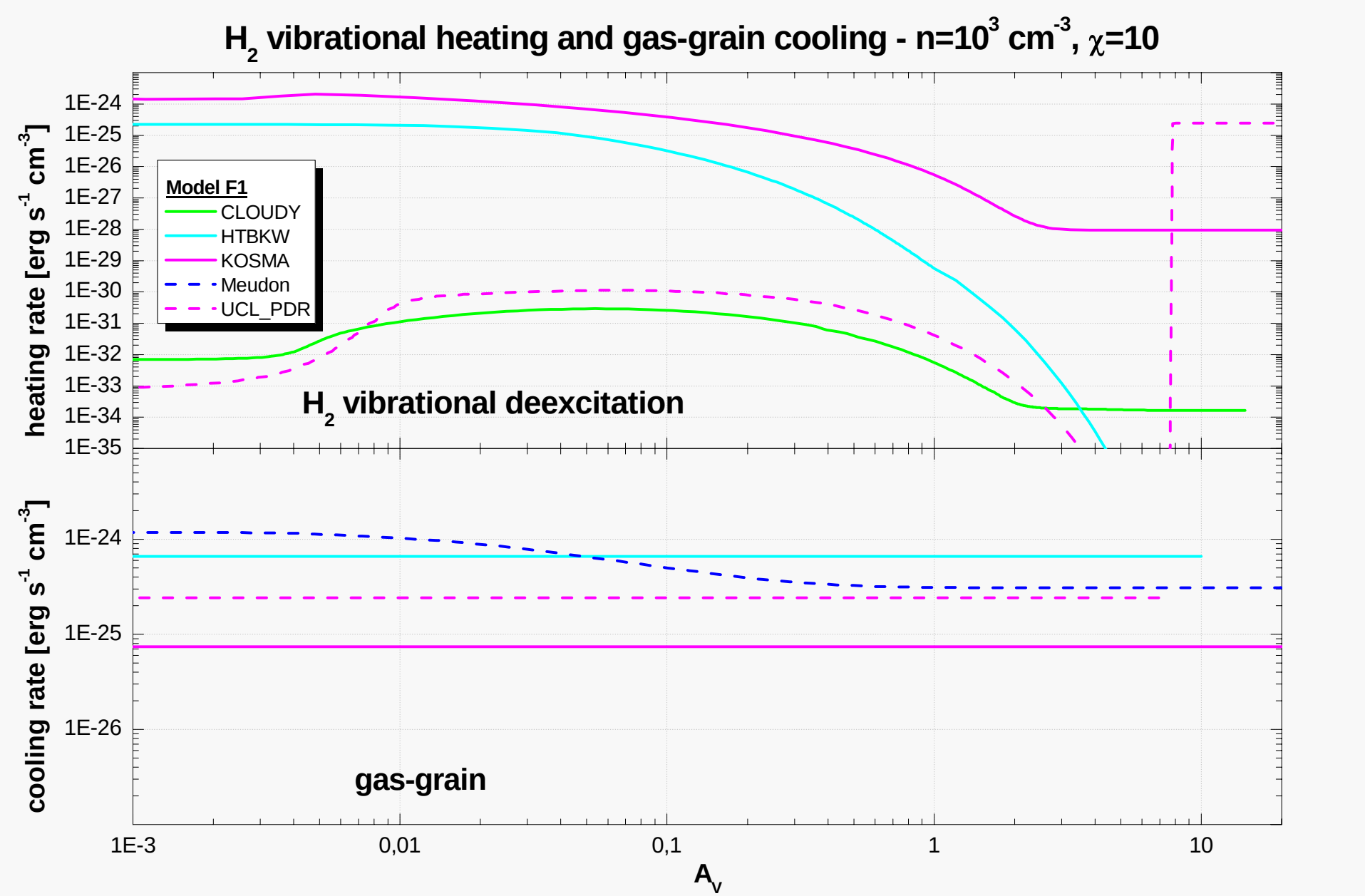

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
CII (158µ)
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

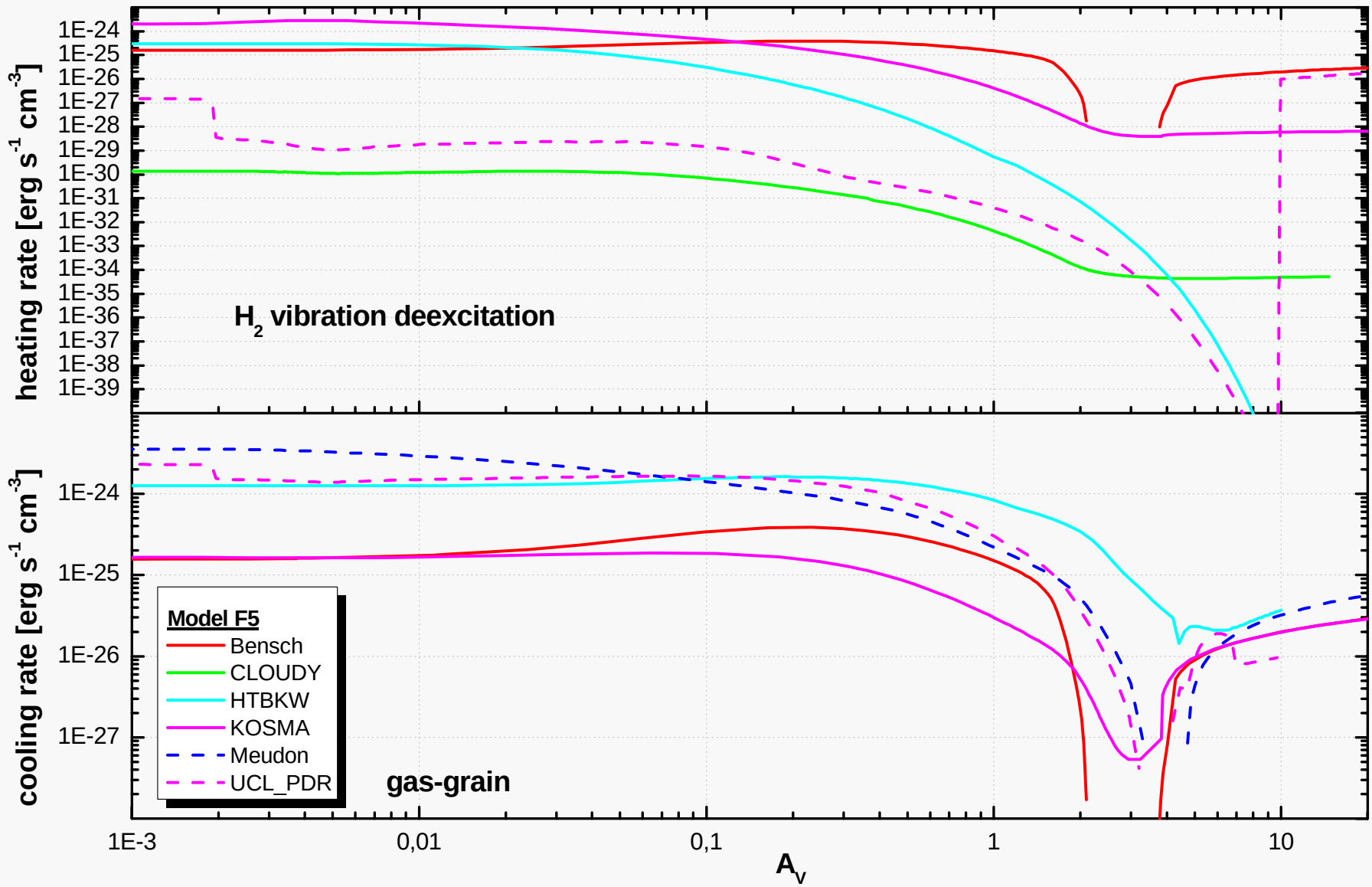

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F4
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V


C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
PE heating
local emissivity [erg s^-1 cm^-3]
C+(158µ)
Model F4
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
Sternberg
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

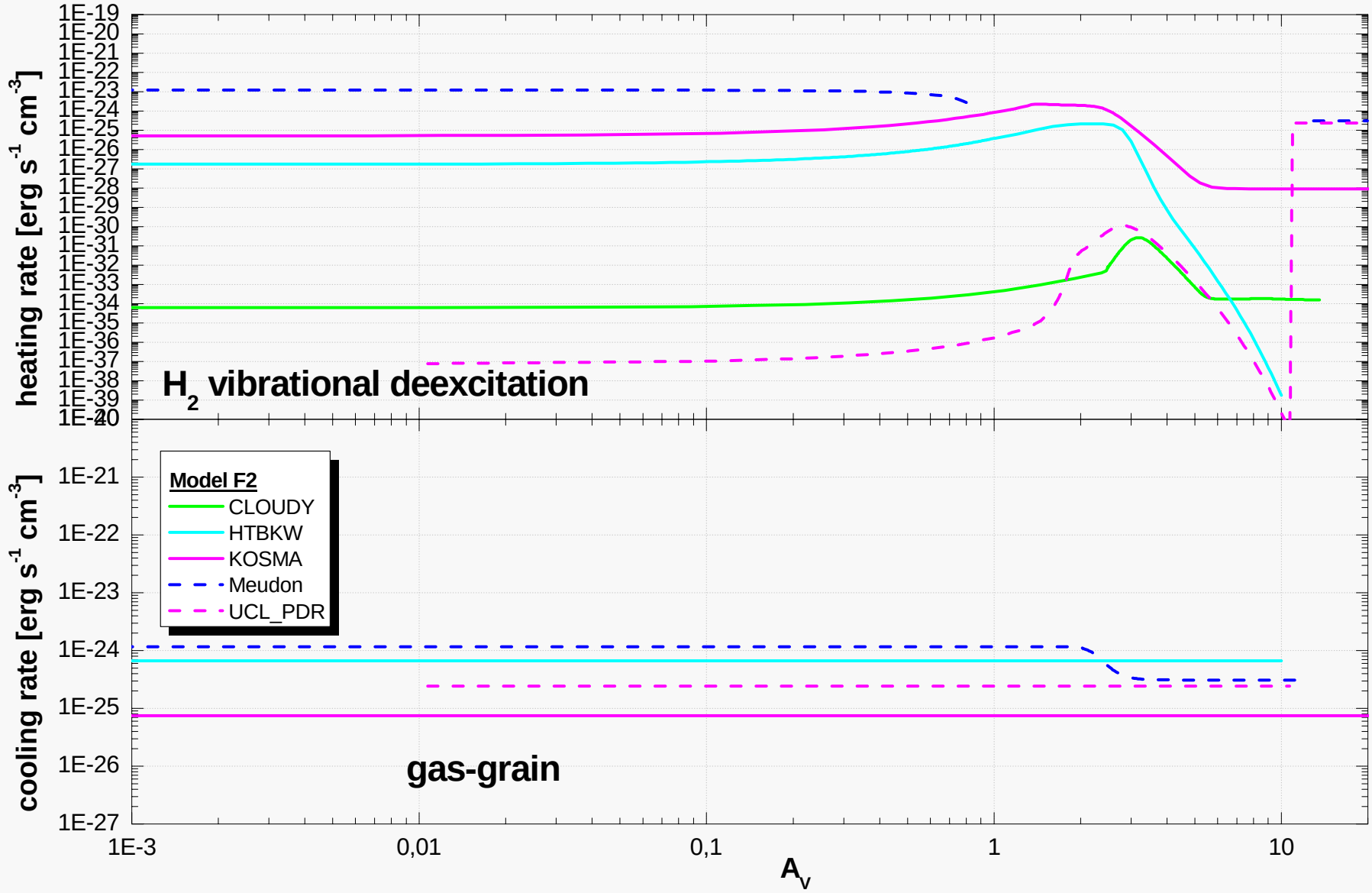

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^5, variable T
local emissivity [erg s^-1 cm^-3]
heating rate [erg s^-1 cm^-3]
PE heating
CII (158µ)
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
AV

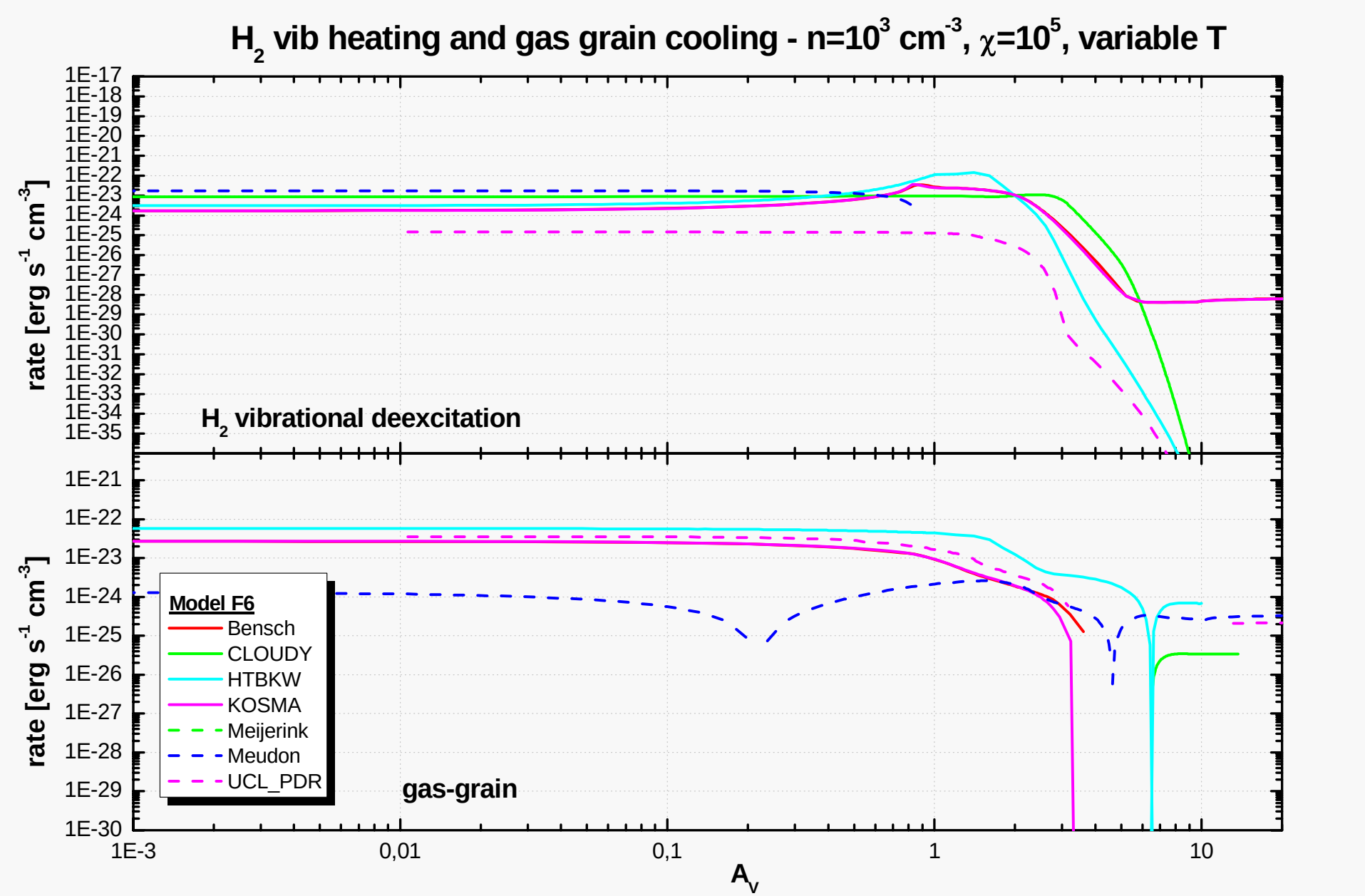

C+(158µ) cooling and PE heating - n=10^5.5 cm^-3, χ=10^5, variable T
local emissivity [erg s^-1 cm^-3]
PE heating
heating rate [erg s^-1 cm^-3]
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
CII (158µ)
1E-3
0,01
0,1
1
10
AV

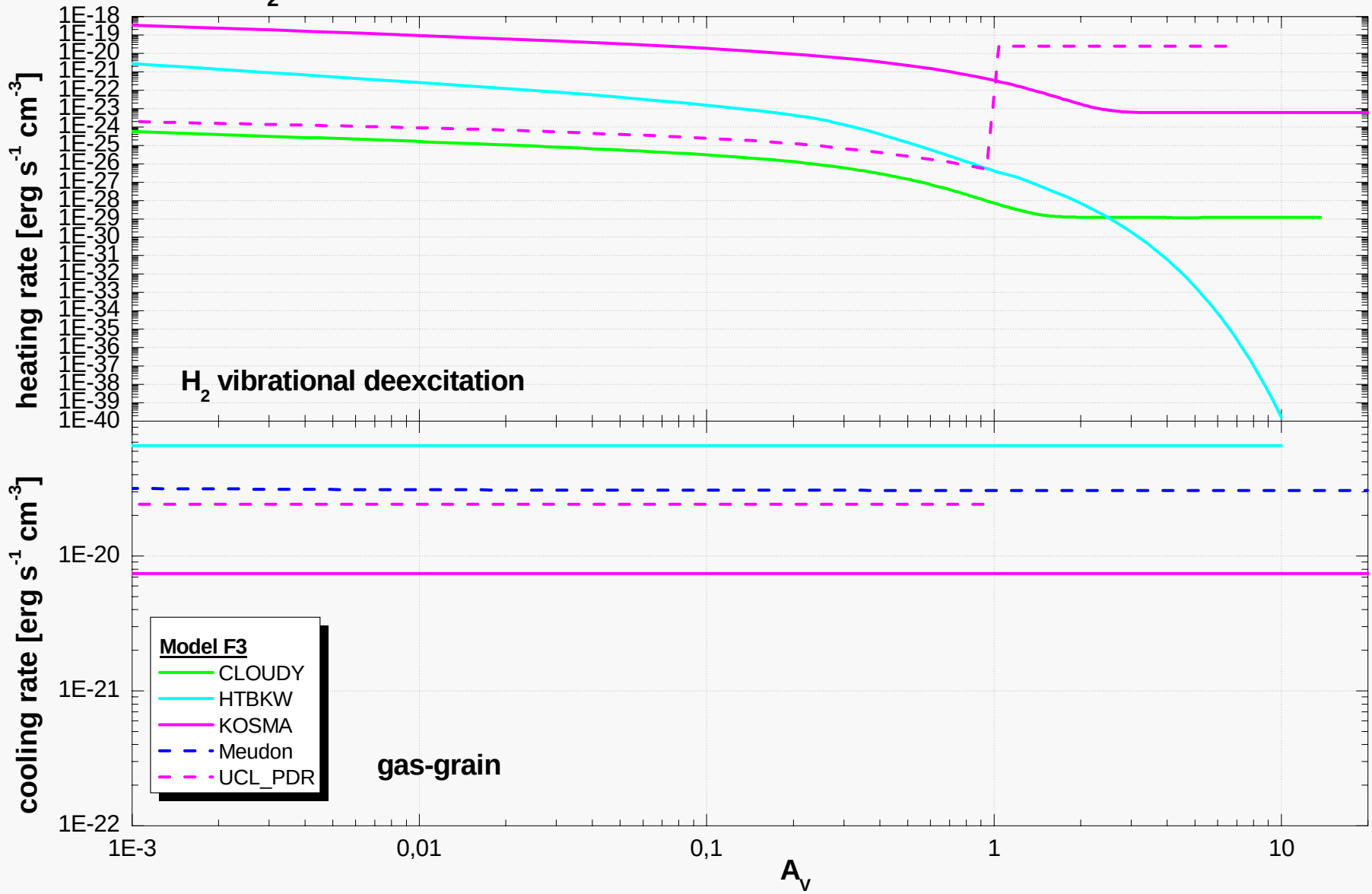

H2 vibrational heating and gas-grain cooling - n=10^3 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
cooling rate [erg s^-1 cm^-3]
Model F1
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
H2 vibrational deexcitation
gas-grain
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
1E-33
1E-34
1E-35
1E-3
0,01
0,1
1
10
AV

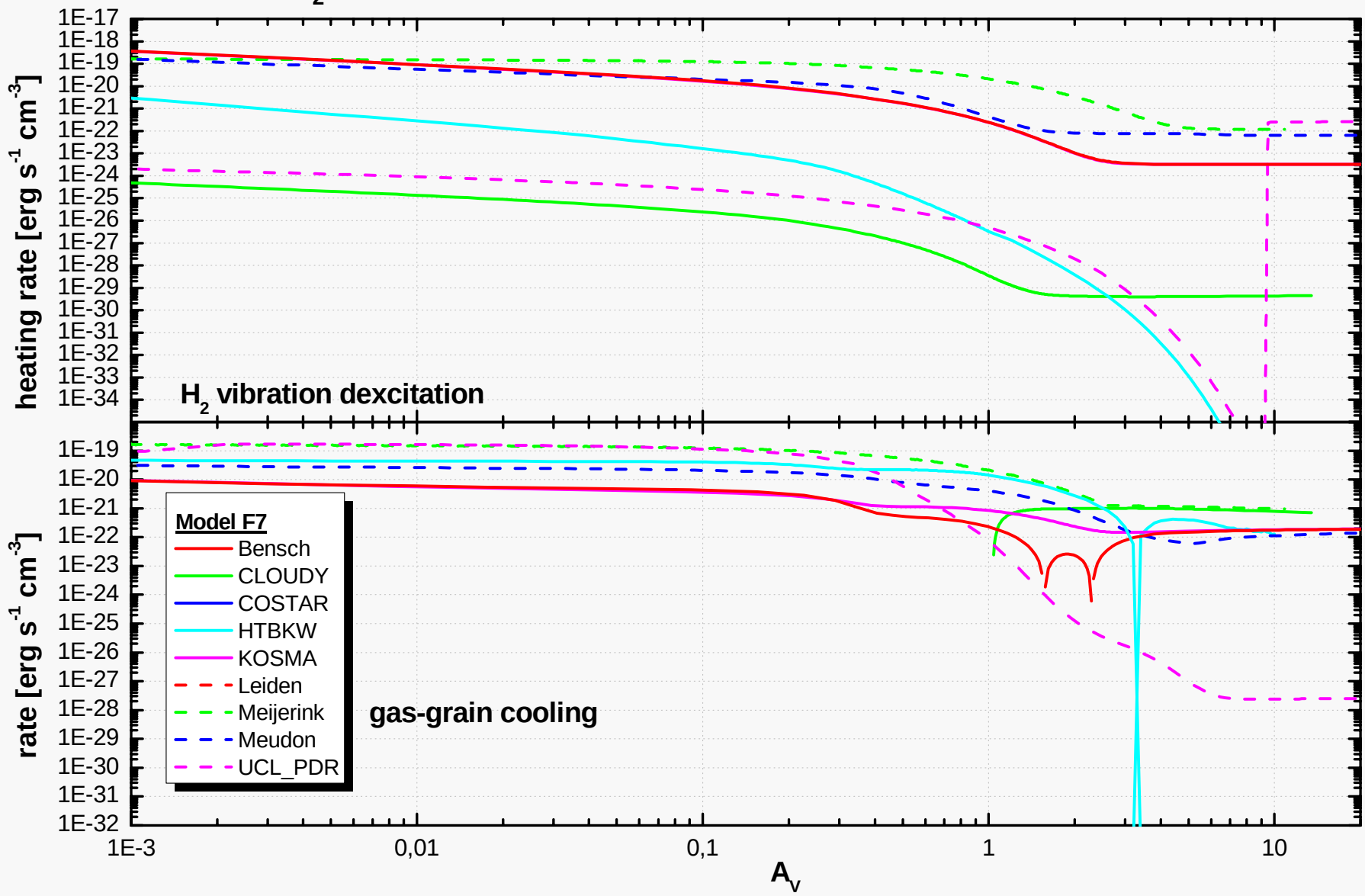

H2 vibrational heating and gas-grain cooling - n=10^3 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
1E-33
1E-34
1E-35
1E-36
1E-37
1E-38
1E-39
H2 vibration deexcitation
cooling rate [erg s^-1 cm^-3]
1E-24
1E-25
1E-26
1E-27
Model F5
Bensch
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
gas-grain
1E-3
0,01
0,1
1
10
Av

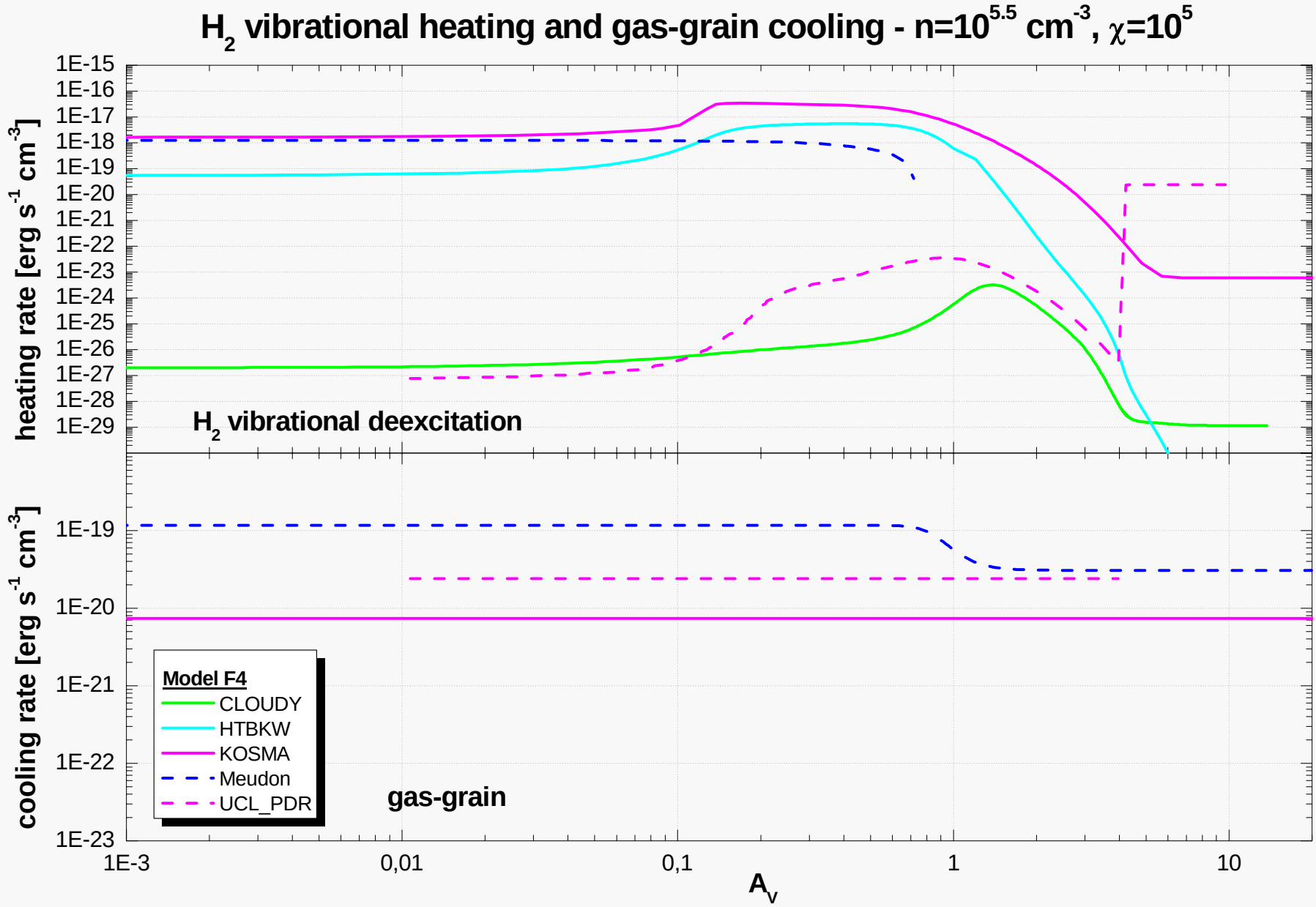
H_2 vibrational heating and gas-grain cooling- $n=10^3$ cm^{-3}, $\chi=10^5$

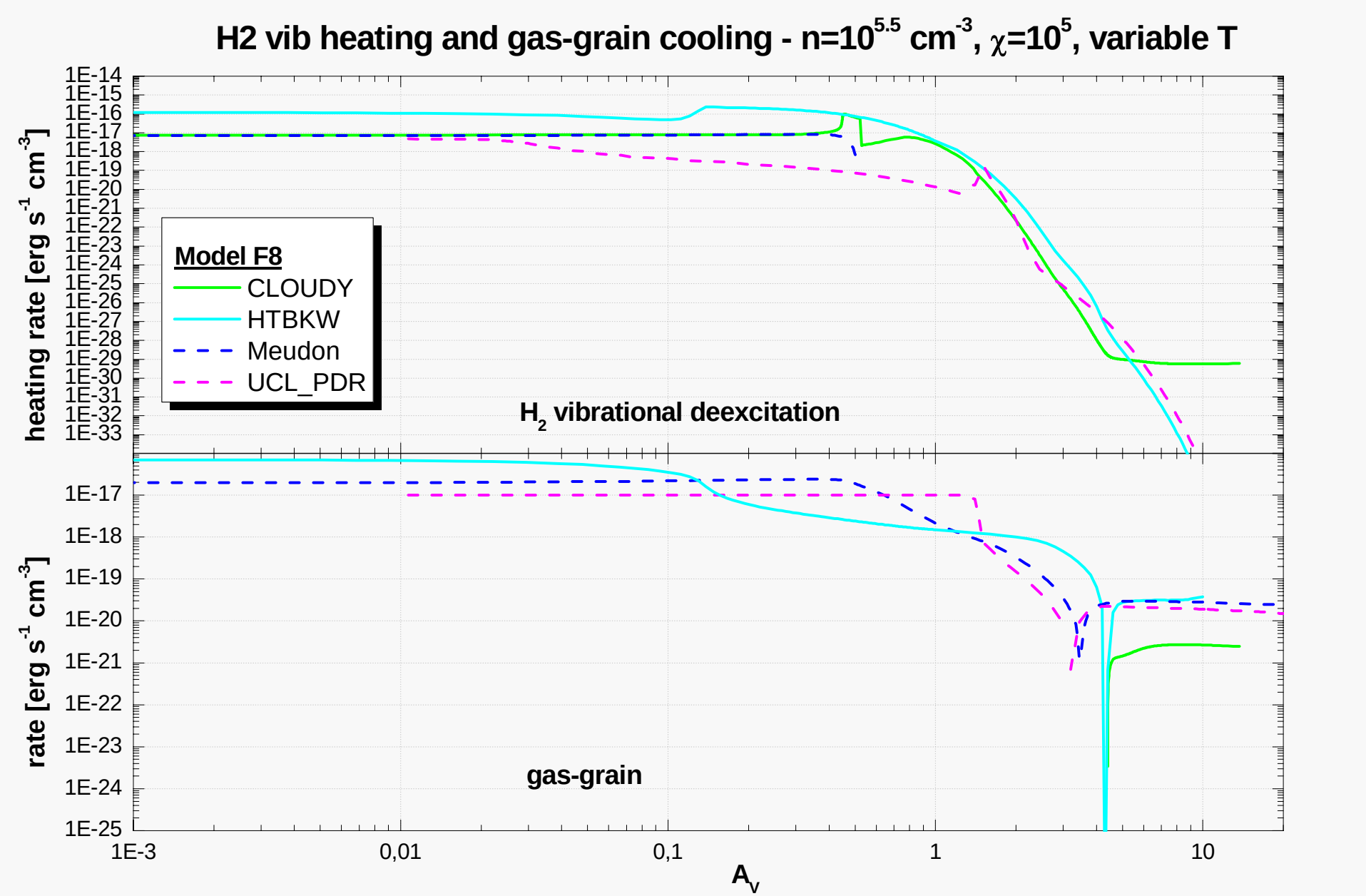



H2 vib heating and gas grain cooling - n=10^3 cm^-3, χ=10^5, variable T
rate [erg s^-1 cm^-3]
H2 vibrational deexcitation
gas-grain
Model F6
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
1E-3
0,01
0,1
1
10
A_V

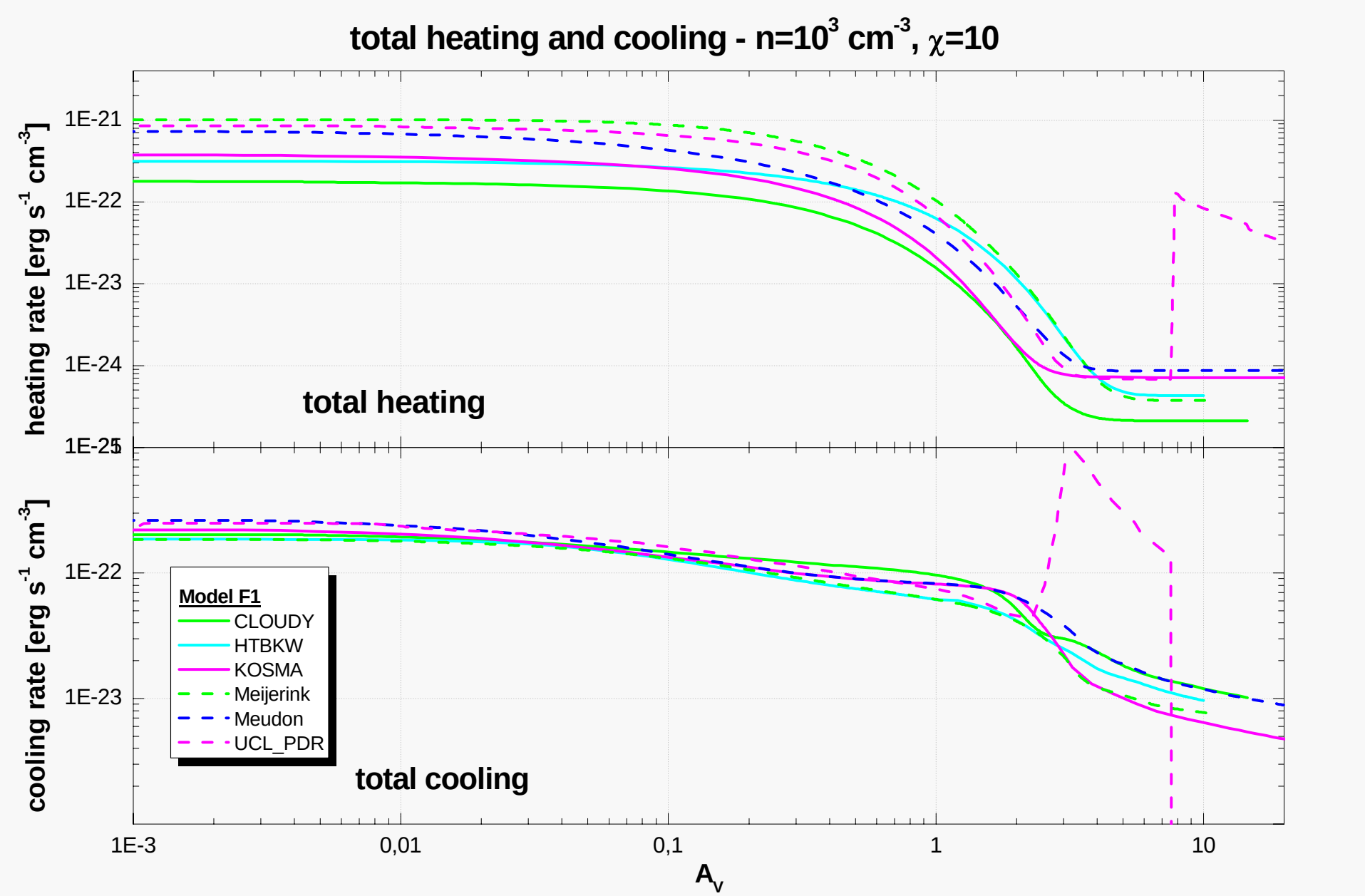

H2 vibrational heating and gas-grain cooling - n=10^5.5 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
1E-33
1E-34
1E-35
1E-36
1E-37
1E-38
1E-39
1E-40
H2 vibrational deexcitation
cooling rate [erg s^-1 cm^-3]
1E-20
1E-21
1E-22
Model F3
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
gas-grain
1E-3
0,01
0,1
1
10
AV

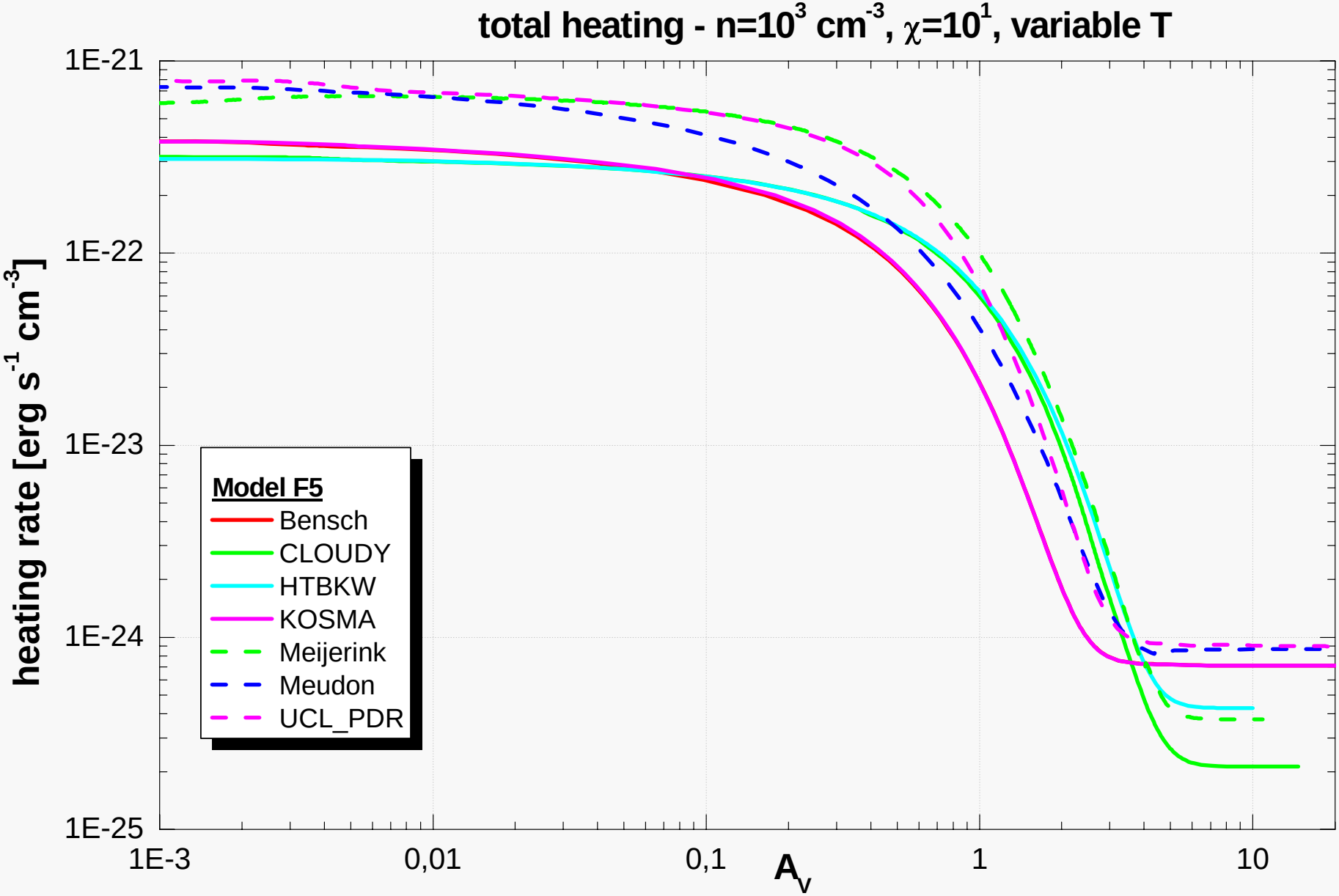

H2 vib and gas-grain cooling - n=10^5.5 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
1E-17
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
1E-33
1E-34
H2 vibration dexcitation
rate [erg s^-1 cm^-3]
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
1E-30
1E-31
1E-32
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
gas-grain cooling
1E-3
0,01
0,1
1
10
A_V

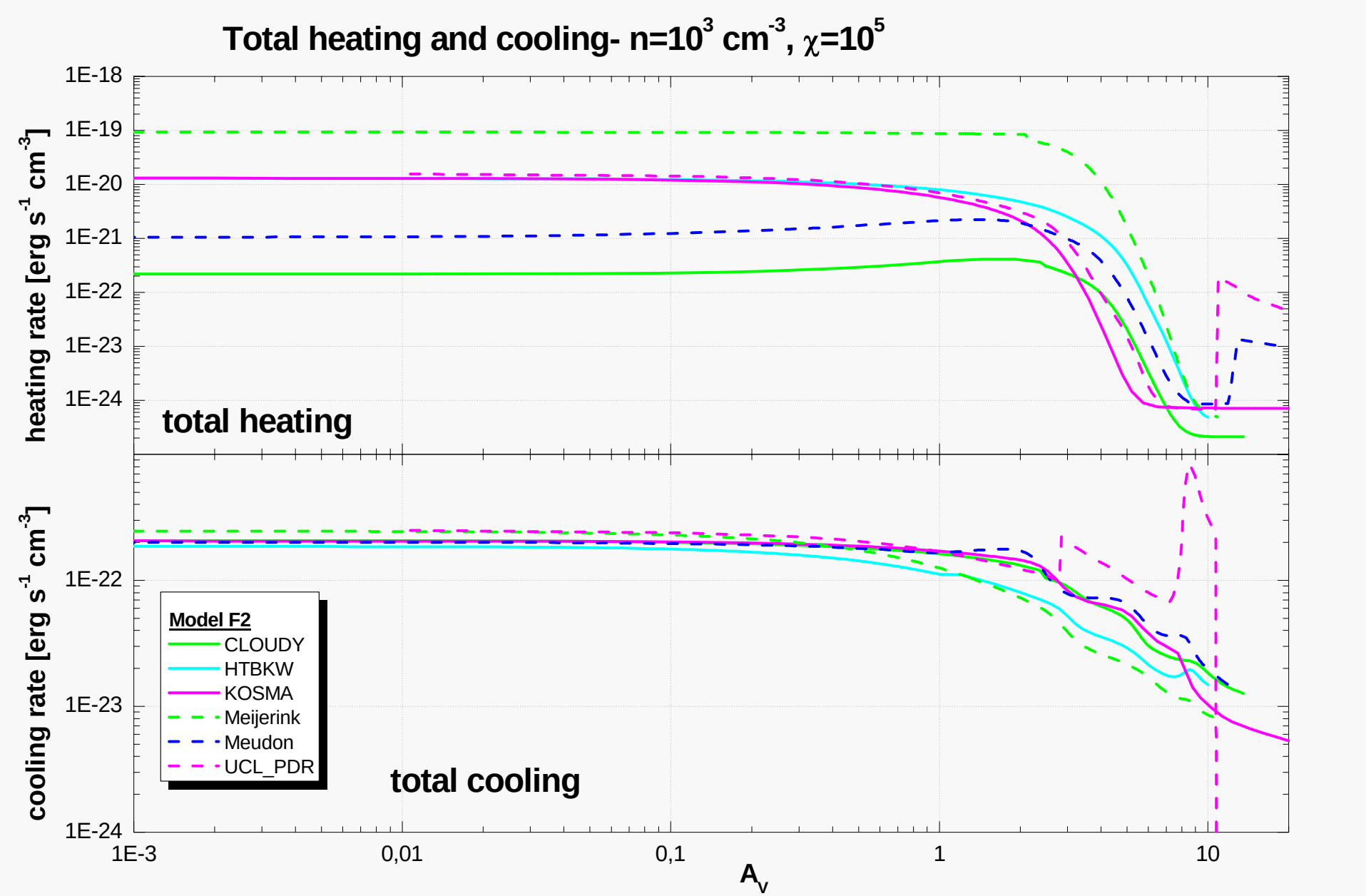

H2 vibrational heating and gas-grain cooling - n=10^5.5 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
1E-15
1E-16
1E-17
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-26
1E-27
1E-28
1E-29
H2 vibrational deexcitation
cooling rate [erg s^-1 cm^-3]
1E-19
1E-20
1E-21
1E-22
1E-23
Model F4
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
gas-grain
1E-3
0,01
0,1
1
10
Av

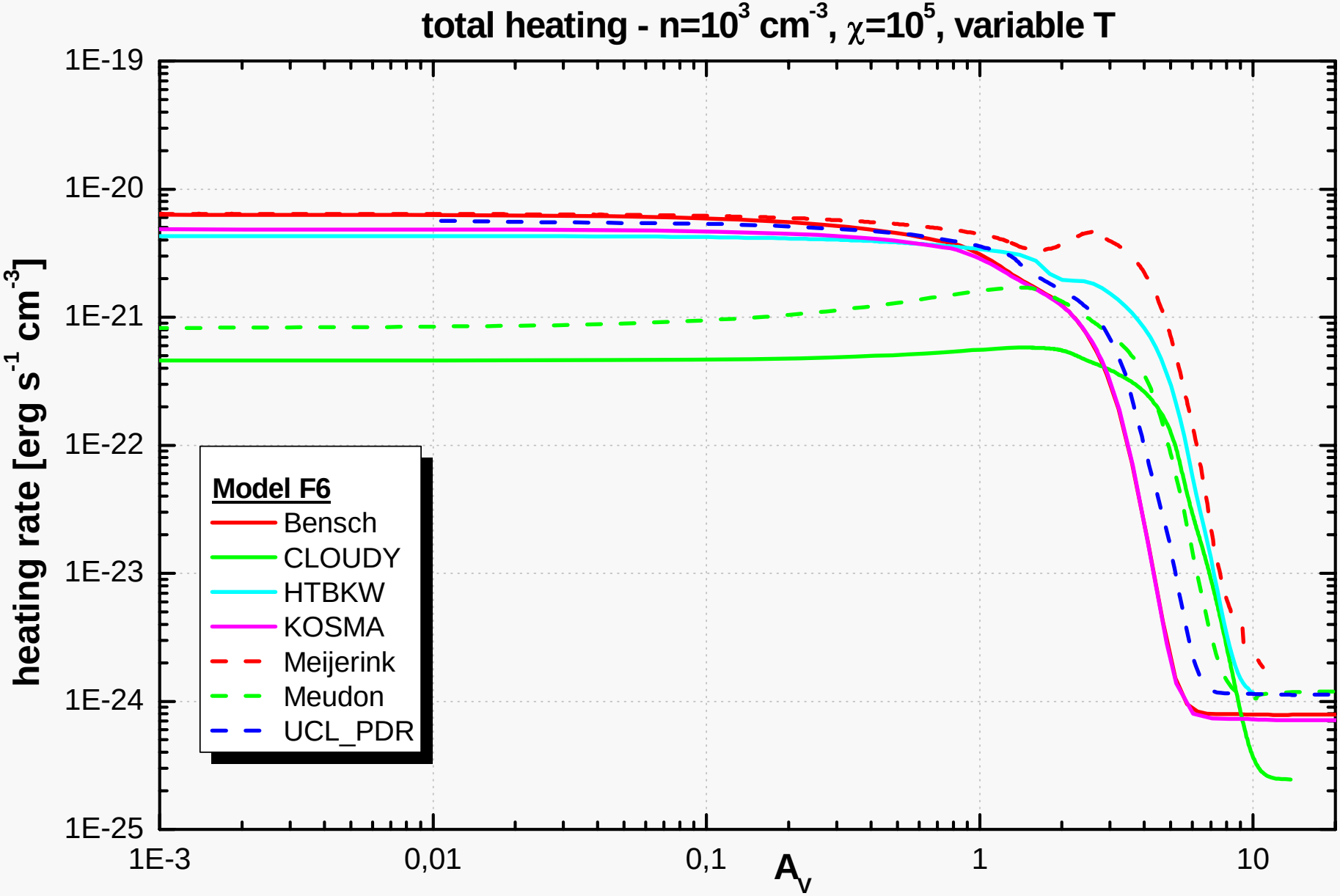

H2 vib heating and gas-grain cooling - n=10^5.5 cm^-3, χ=10^5, variable T
heating rate [erg s^-1 cm^-3]
Model F8
CLOUDY
HTBKW
Meudon
UCL_PDR
H2 vibrational deexcitation
rate [erg s^-1 cm^-3]
gas-grain
AV
1E-3
0,01
0,1
1
10

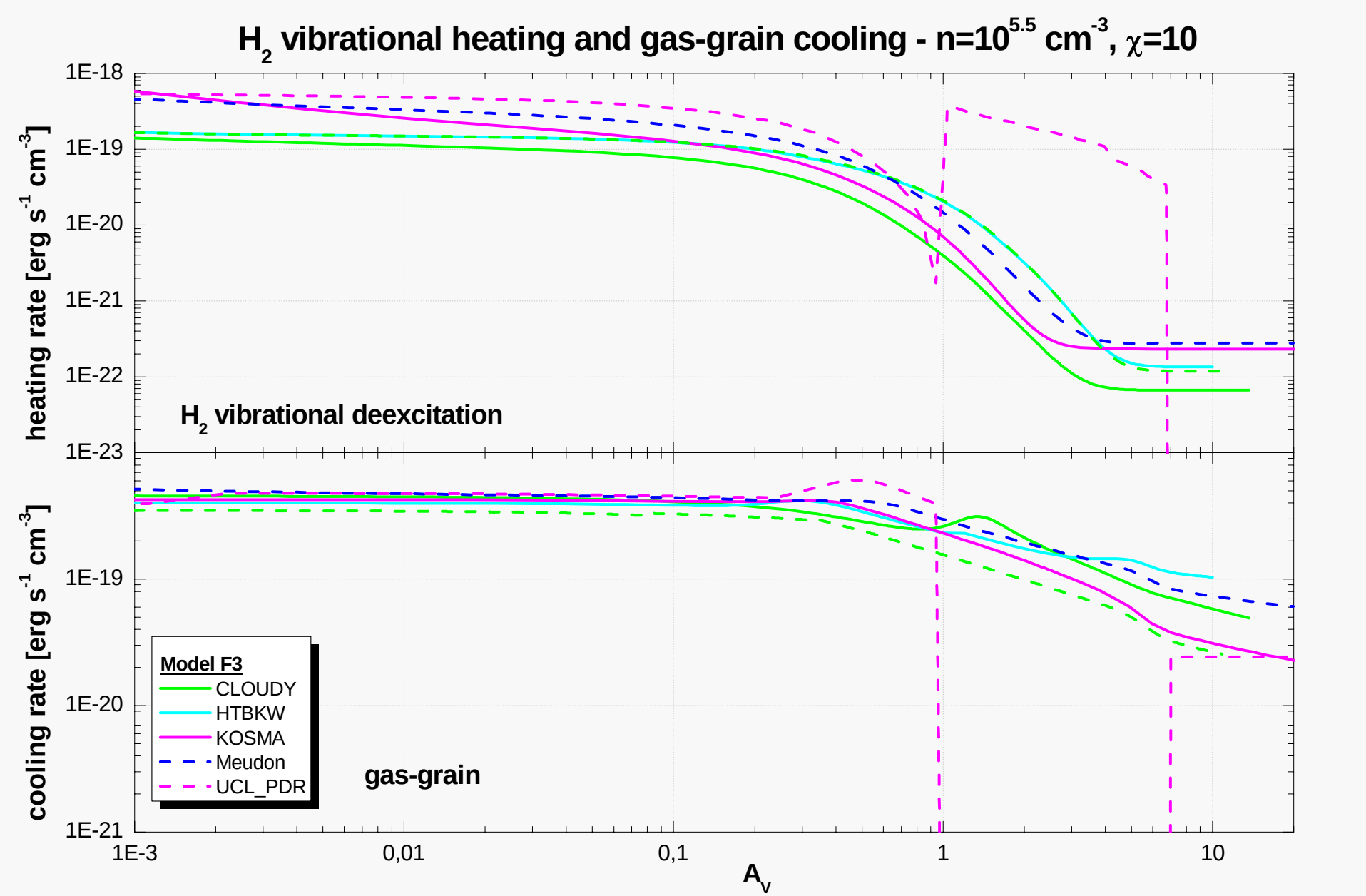
Total heating/cooling

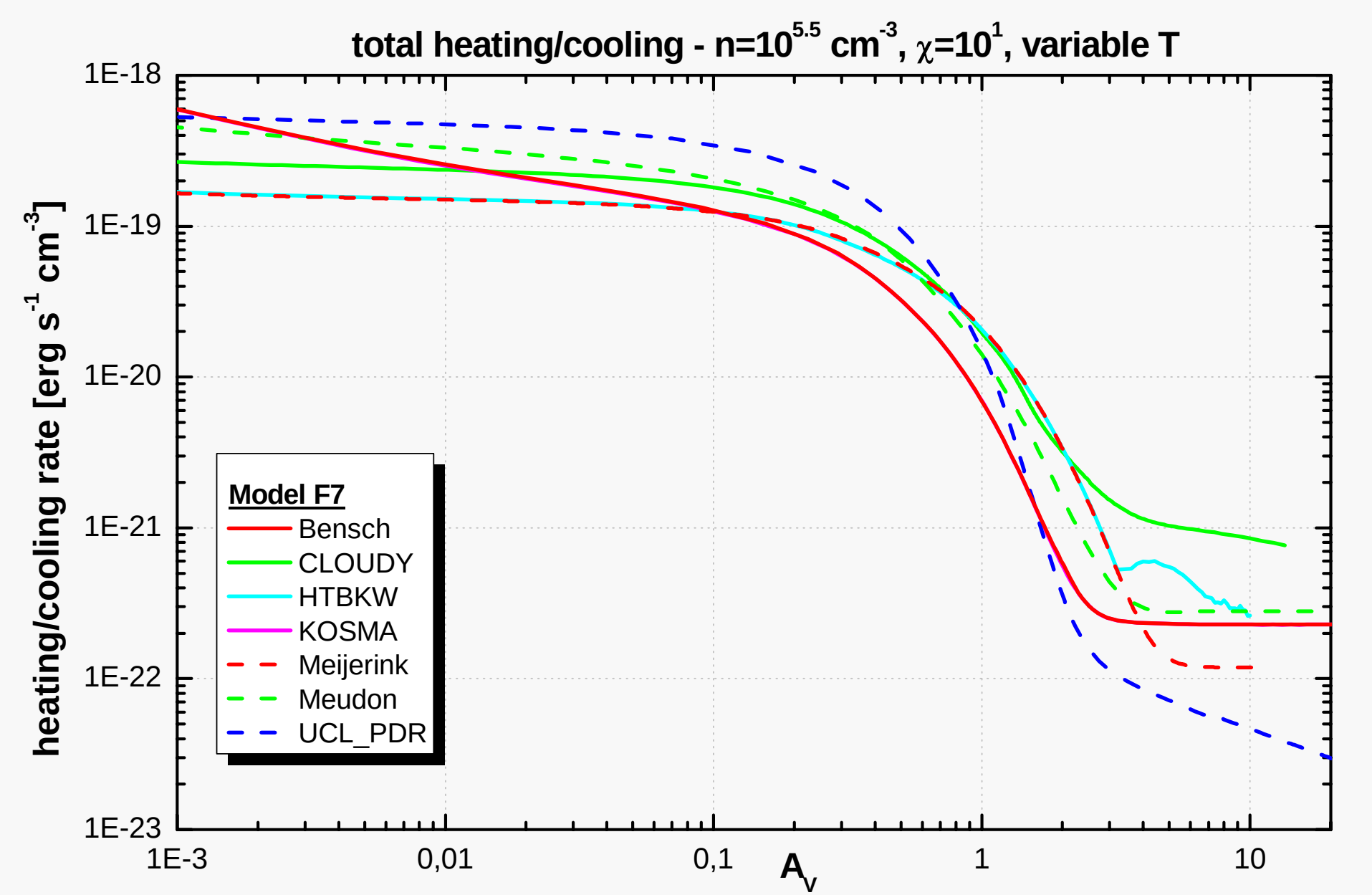

total heating and cooling - n=10^3 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
1E-21
1E-22
1E-23
1E-24
1E-25
total heating
cooling rate [erg s^-1 cm^-3]
1E-22
1E-23
Model F1
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
total cooling
1E-3
0,01
0,1
1
10
A_V

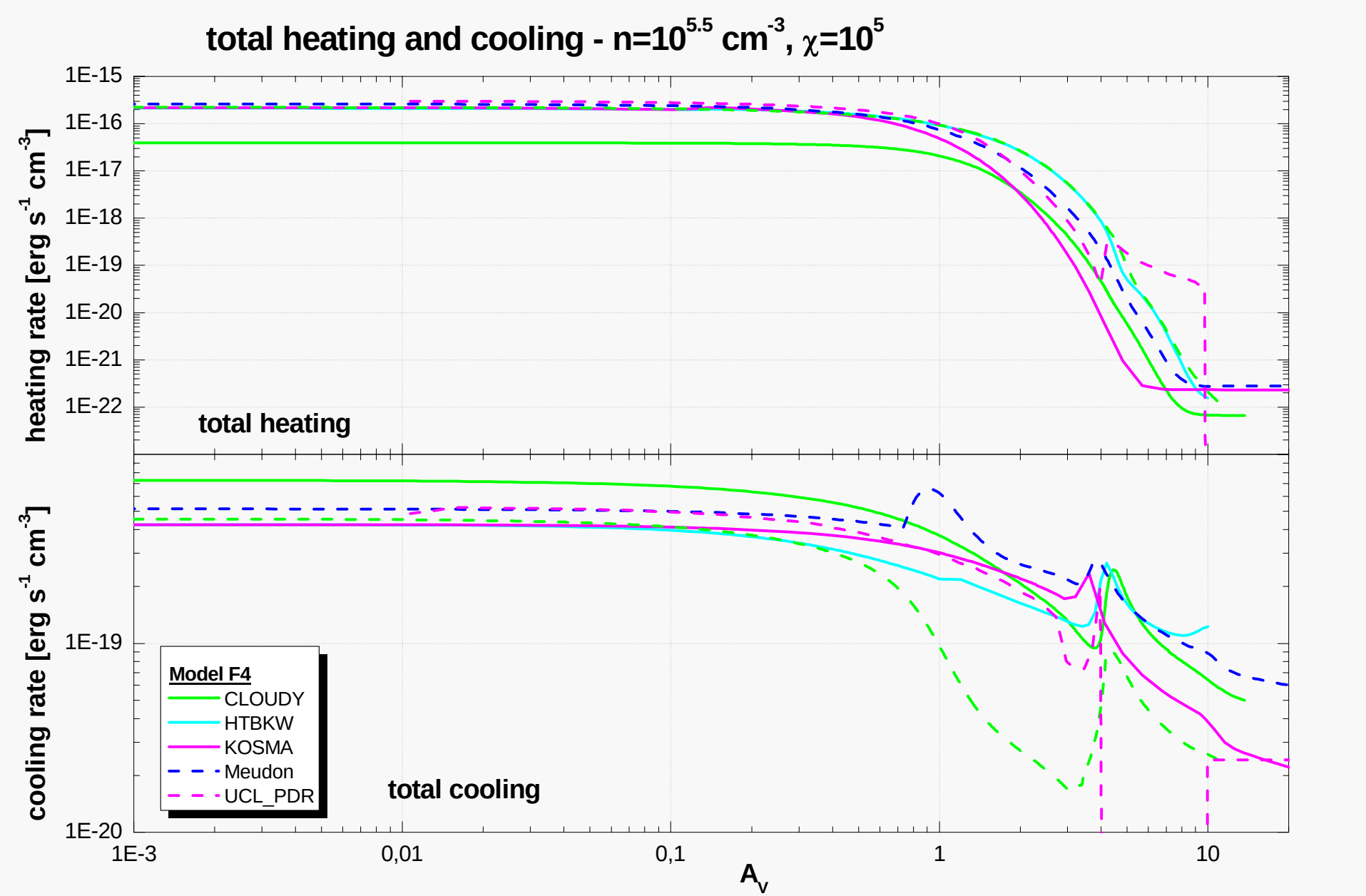

total heating - n=10^3 cm^-3, χ=10^1, variable T
heating rate [erg s^-1 cm^-3]
1E-21
1E-22
1E-23
1E-24
1E-25
1E-3
0,01
0,1
1
10
A_V
Model F5
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR

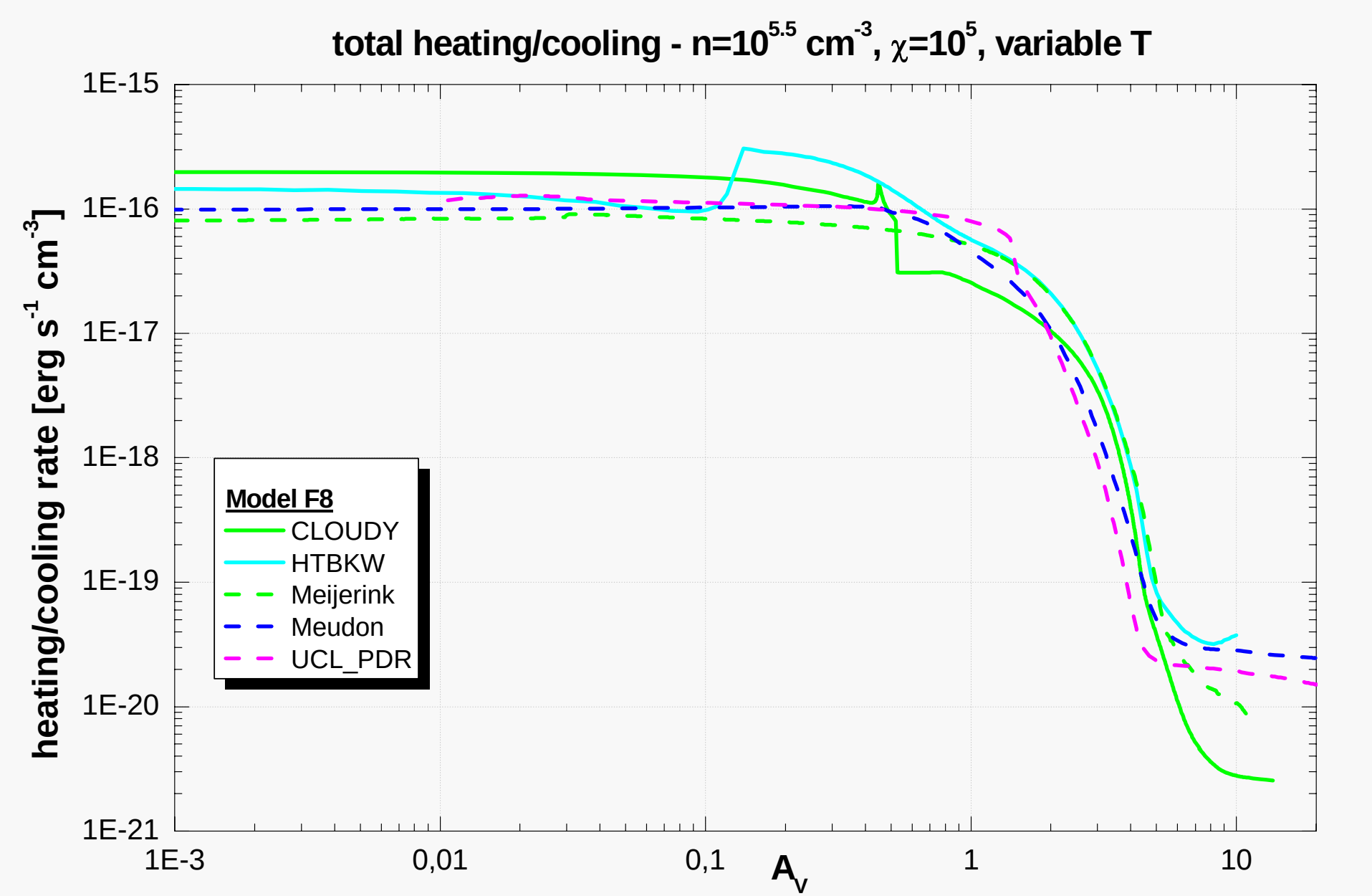

Total heating and cooling- n=10^3 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
total heating
cooling rate [erg s^-1 cm^-3]
1E-22
1E-23
1E-24
Model F2
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR
total cooling
1E-3
0,01
0,1
1
10
A_V


total heating - n=10^3 cm^-3, χ=10^5, variable T
heating rate [erg s^-1 cm^-3]
1E-19
1E-20
1E-21
1E-22
1E-23
1E-24
1E-25
1E-3
0,01
0,1
1
10
A_V
Model F6
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR


H2 vibrational heating and gas-grain cooling - n=10^5.5 cm^-3, χ=10
heating rate [erg s^-1 cm^-3]
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
H2 vibrational deexcitation
cooling rate [erg s^-1 cm^-3]
1E-19
1E-20
1E-21
Model F3
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
gas-grain
1E-3
0,01
0,1
1
10
AV

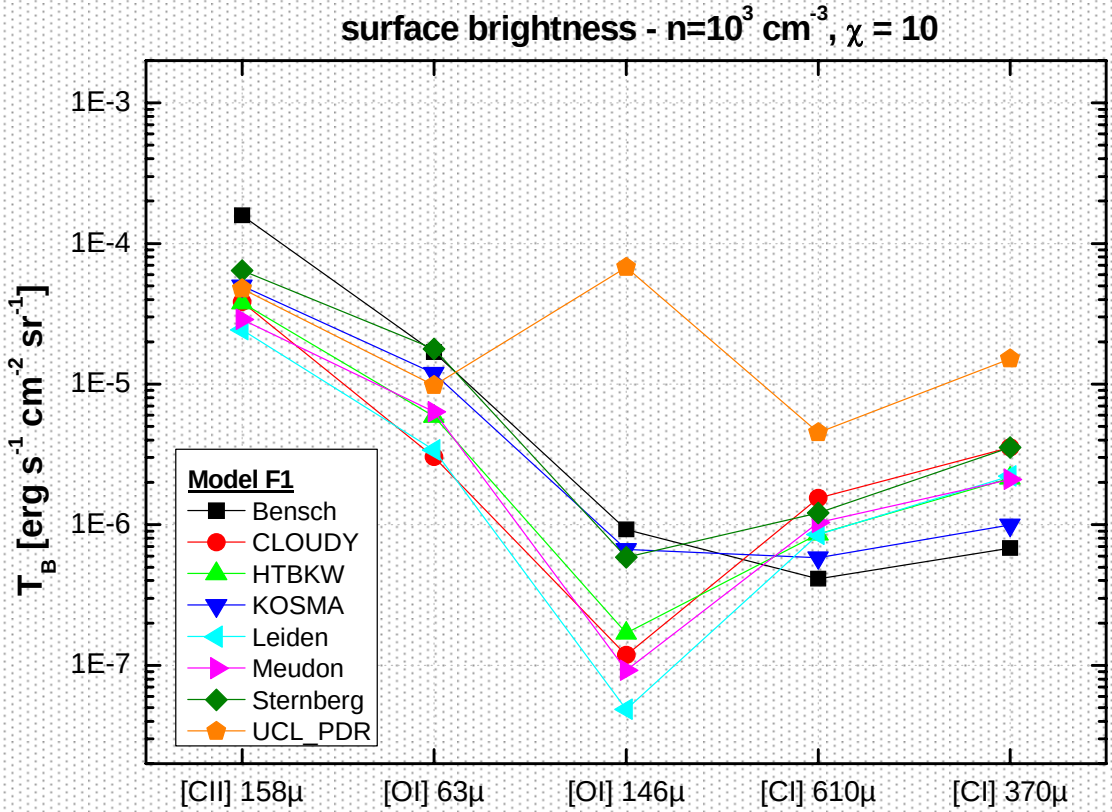

total heating/cooling - n=10^5.5 cm^-3, χ=10^1, variable T
heating/cooling rate [erg s^-1 cm^-3]
1E-18
1E-19
1E-20
1E-21
1E-22
1E-23
1E-3
0,01
0,1
1
10
A_V
Model F7
Bensch
CLOUDY
HTBKW
KOSMA
Meijerink
Meudon
UCL_PDR


total heating and cooling - n=10^5.5 cm^-3, χ=10^5
heating rate [erg s^-1 cm^-3]
1E-15
1E-16
1E-17
1E-18
1E-19
1E-20
1E-21
1E-22
total heating
cooling rate [erg s^-1 cm^-3]
1E-19
1E-20
Model F4
CLOUDY
HTBKW
KOSMA
Meudon
UCL_PDR
total cooling
1E-3
0,01
0,1
1
10
A_V

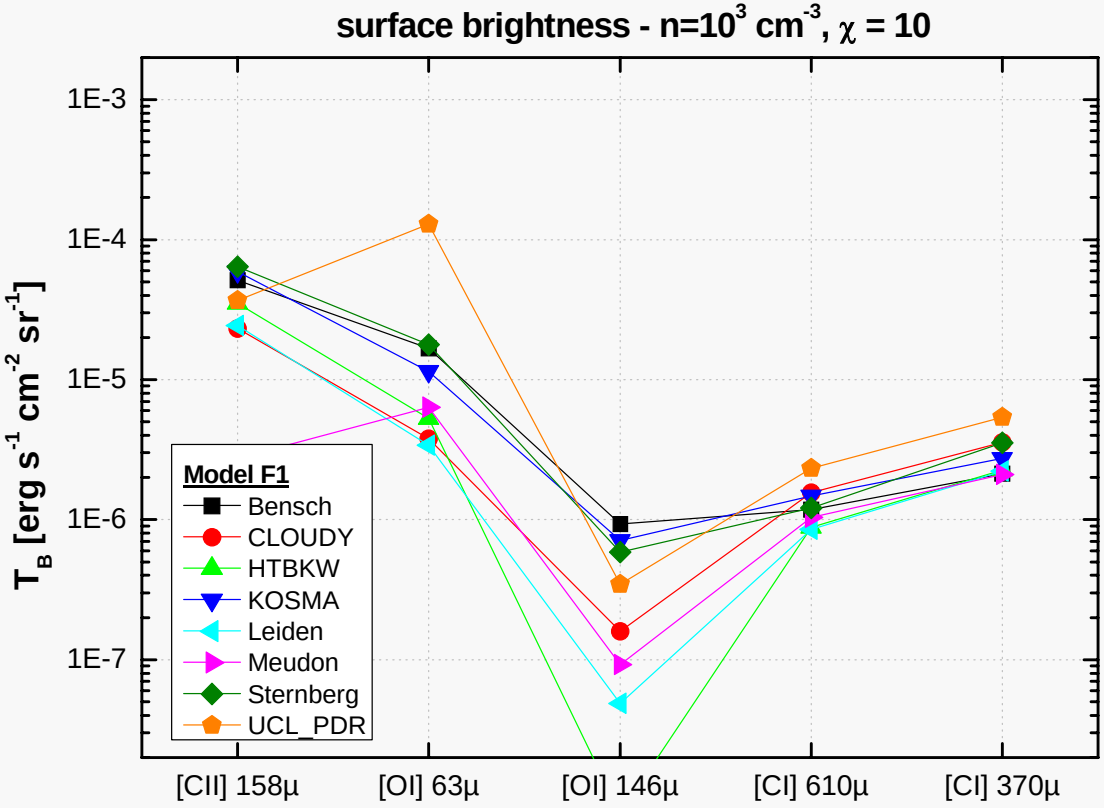

total heating/cooling - n=10^5.5 cm^-3, χ=10^5, variable T
heating/cooling rate [erg s^-1 cm^-3]
1E-15
1E-16
1E-17
1E-18
1E-19
1E-20
1E-21
1E-3
0,01
0,1
1
10
A_V
Model F8
CLOUDY
HTBKW
Meijerink
Meudon
UCL_PDR

Model Results F1-F8

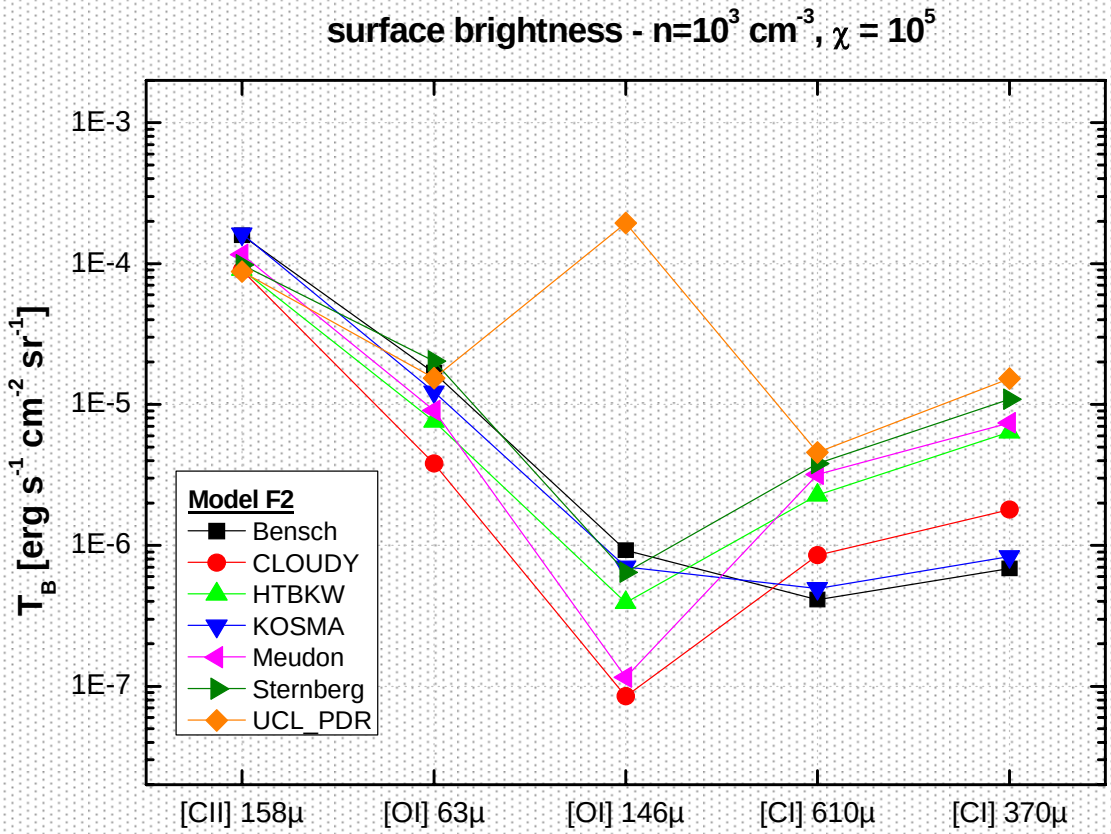
- photoreaction rates
- densities
- heating/cooling rates
- surface brightnesses



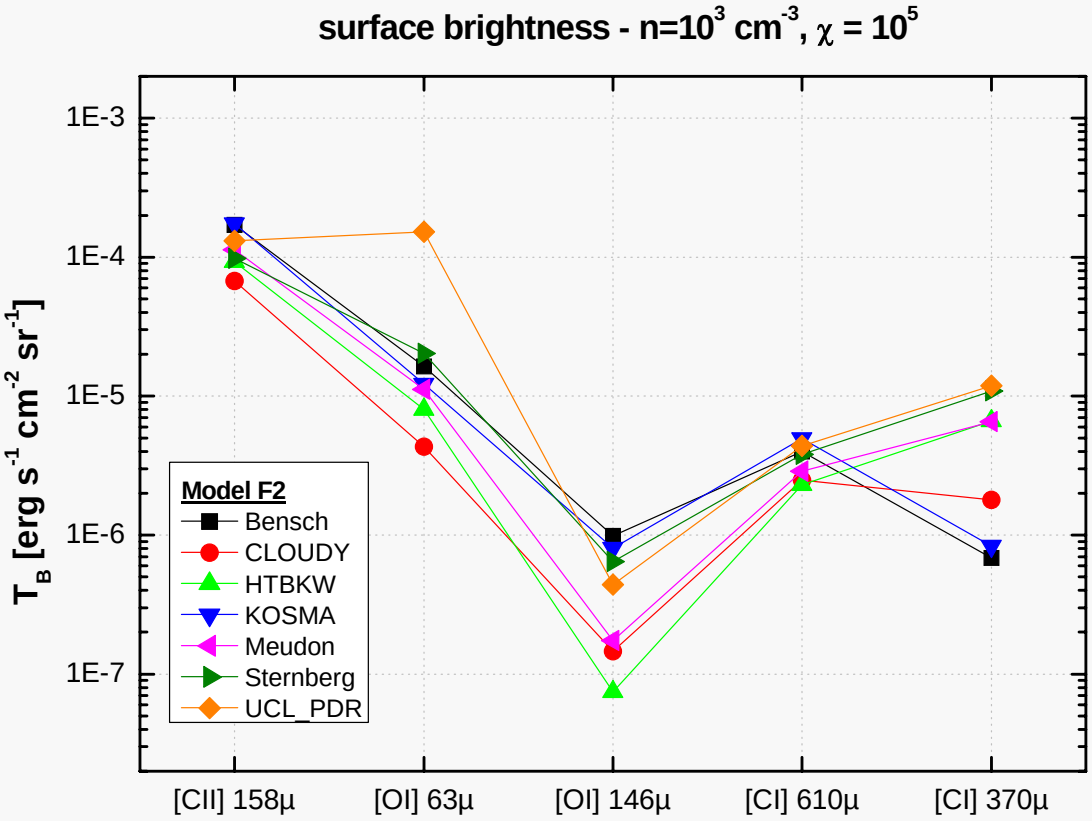
	Bensch	CLOUDY	HTBKW	KOSMA	Leiden	Meudon	Sternberg	UCL_PDR
[CII] 158µ	1,58E-04	3,83E-05	3,79E-05	5,00E-05	2,43E-05	2,88E-05	6,42E-05	4,77E-05
[OI] 63µ	1,68E-05	3,02E-06	5,89E-06	1,19E-05	3,39E-06	6,34E-06	1,78E-05	9,77E-06
[OI] 146µ	9,24E-07	1,18E-07	1,70E-07	6,69E-07	4,86E-08	9,23E-08	5,88E-07	6,76E-05
[CI] 610µ	4,11E-07	1,55E-06	8,59E-07	5,84E-07	8,51E-07	1,04E-06	1,21E-06	4,51E-06
[CI] 370µ	6,82E-07	3,54E-06	2,15E-06	9,94E-07	2,21E-06	2,10E-06	3,54E-06	1,51E-05



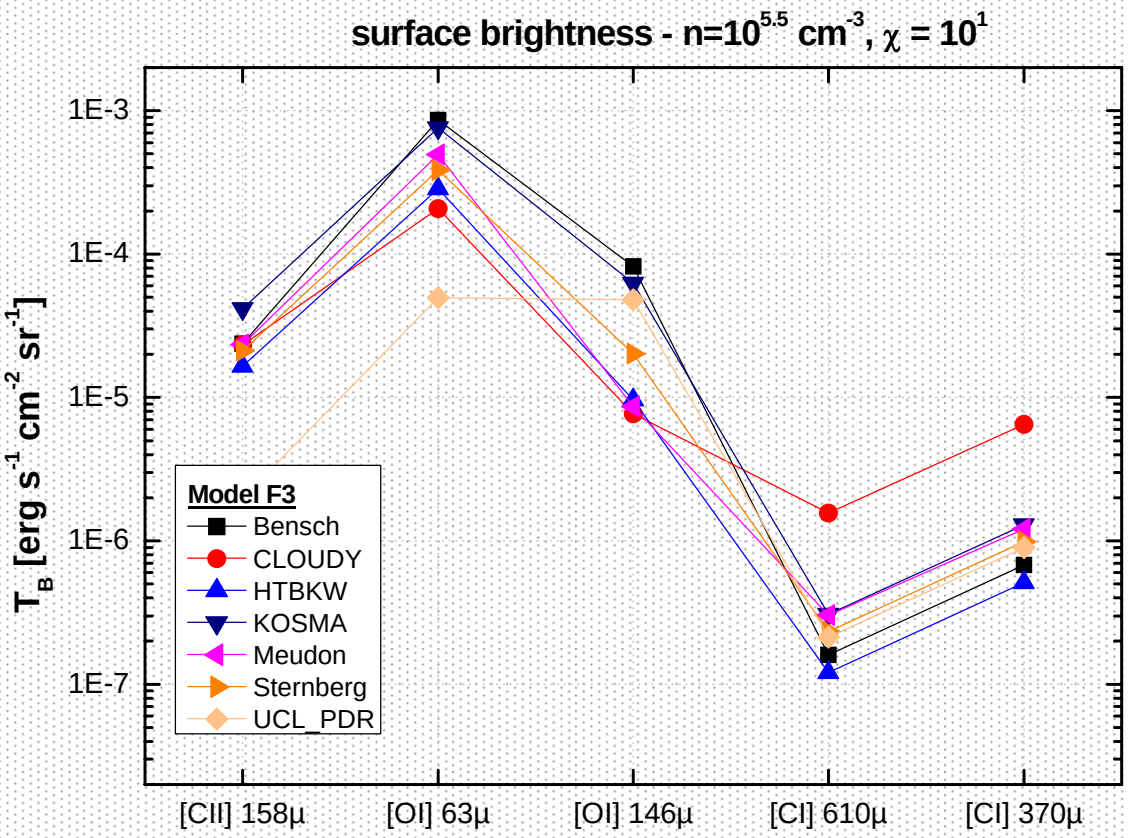
	Bensch	CLOUDY	HTBKW	KOSMA	Leiden	Meudon	Sternberg	UCL_PDR
[CII] 158µ	5,14E-05	2,31E-05	3,51E-05	5,92E-05	2,43E-05	2,74E-06	6,42E-05	3,67E-05
[OI] 63µ	1,67E-05	3,80E-06	5,28E-06	1,15E-05	3,39E-06	6,34E-06	1,78E-05	1,29E-04
[OI] 146µ	9,33E-07	1,60E-07	7,95E-09	7,11E-07	4,86E-08	9,23E-08	5,88E-07	3,45E-07
[CI] 610µ	1,18E-06	1,56E-06	8,81E-07	1,48E-06	8,51E-07	1,04E-06	1,21E-06	2,32E-06
[CI] 370µ	2,13E-06	3,56E-06	2,27E-06	2,74E-06	2,21E-06	2,10E-06	3,54E-06	5,40E-06



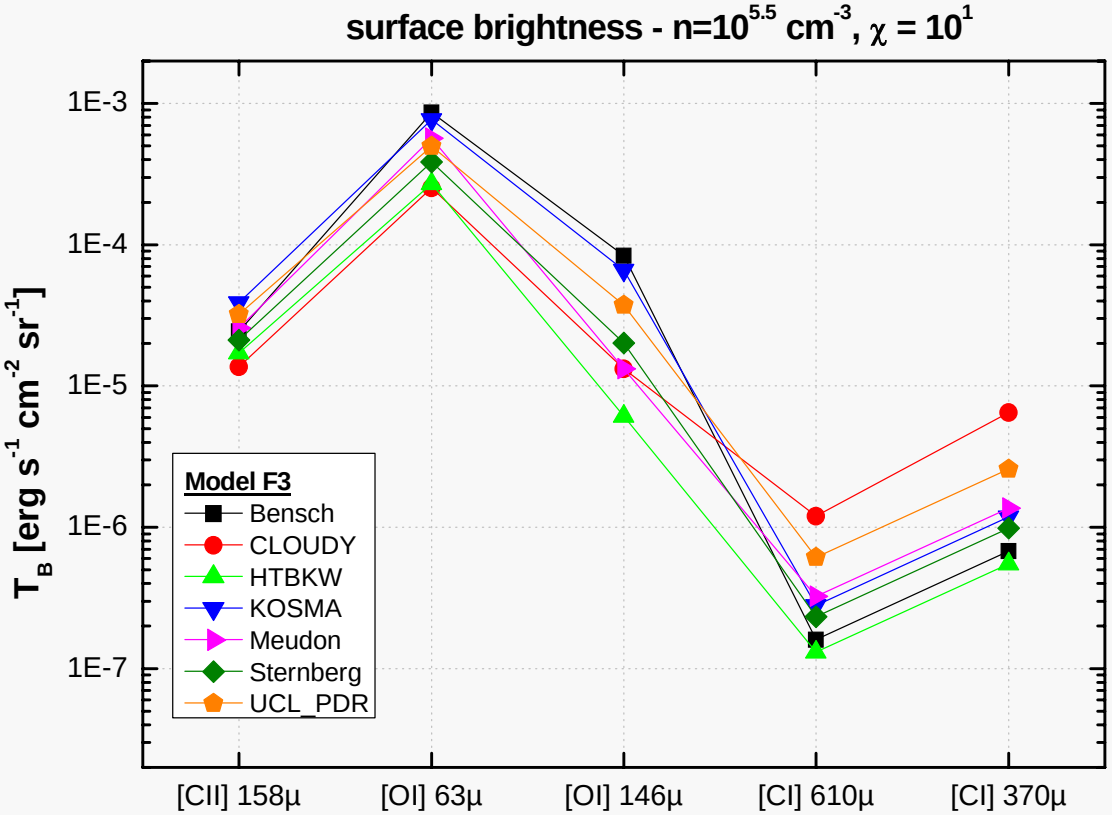
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	1,58E-04	8,93E-05	9,10E-05	1,63E-04	1,16E-04	9,78E-05	8,77E-05
[OI] 63µ	1,68E-05	3,80E-06	7,59E-06	1,23E-05	9,08E-06	2,03E-05	1,54E-05
[OI] 146µ	9,24E-07	8,48E-08	3,93E-07	7,01E-07	1,16E-07	6,43E-07	1,94E-04
[CI] 610µ	4,11E-07	8,53E-07	2,28E-06	4,93E-07	3,20E-06	3,81E-06	4,56E-06
[CI] 370µ	6,82E-07	1,79E-06	6,35E-06	8,35E-07	7,41E-06	1,09E-05	1,53E-05



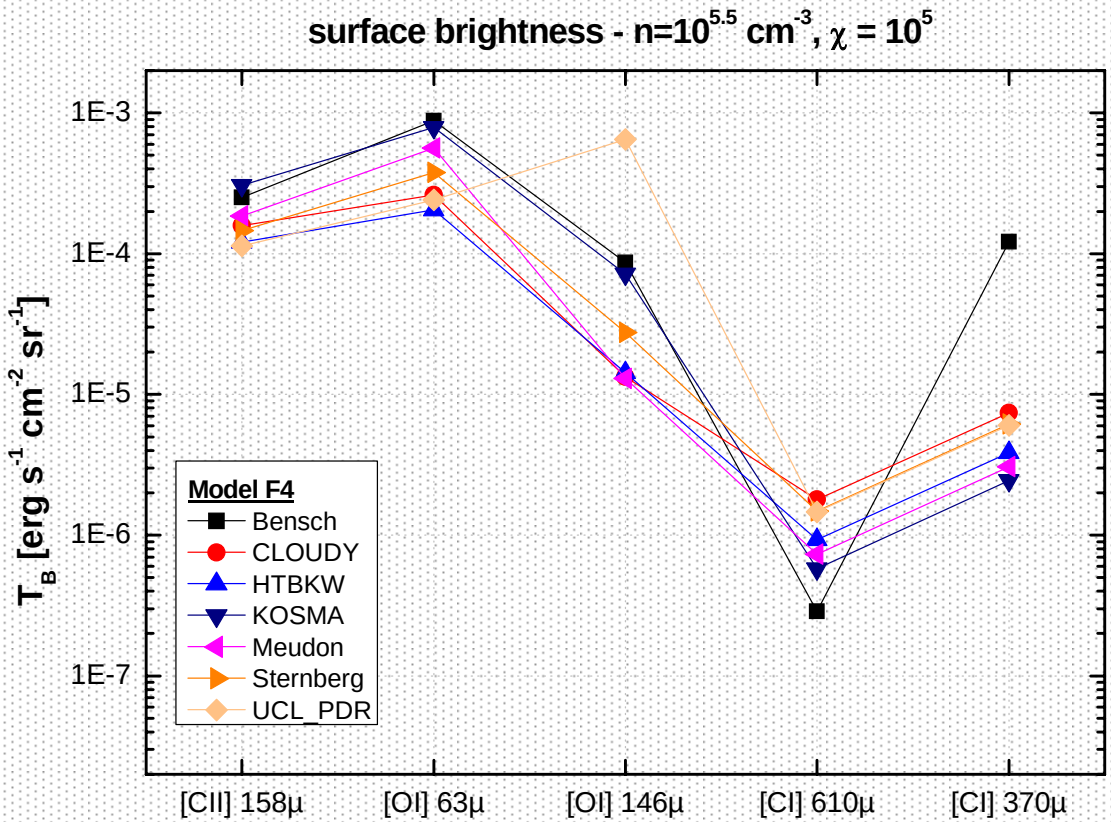
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	1,71E-04	6,72E-05	9,29E-05	1,74E-04	1,13E-04	9,78E-05	1,31E-04
[OI] 63µ	1,63E-05	4,31E-06	8,04E-06	1,22E-05	1,12E-05	2,03E-05	1,53E-04
[OI] 146µ	9,85E-07	1,46E-07	7,47E-08	8,02E-07	1,73E-07	6,43E-07	4,41E-07
[CI] 610µ	4,00E-06	2,49E-06	2,30E-06	4,97E-06	2,89E-06	3,81E-06	4,38E-06
[CI] 370µ	6,82E-07	1,79E-06	6,62E-06	8,35E-07	6,53E-06	1,09E-05	1,19E-05



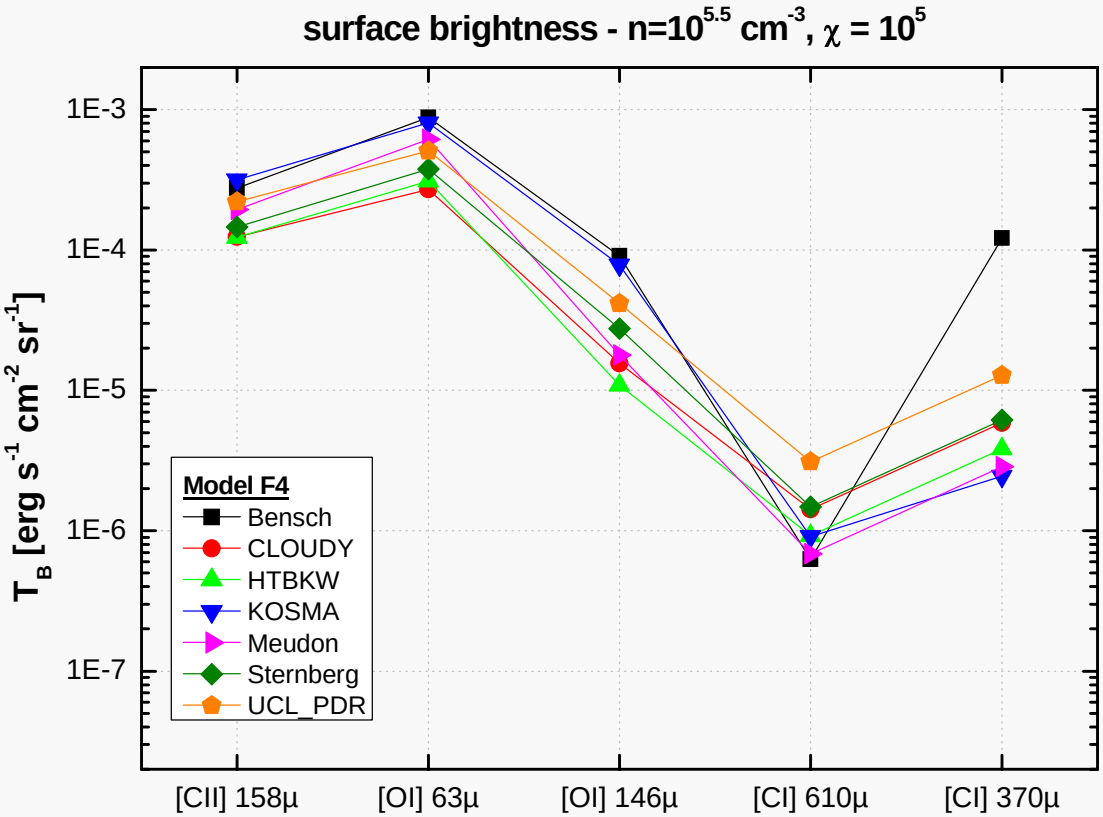
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	2,37E-05	2,32E-05	1,66E-05	4,17E-05	2,34E-05	2,12E-05	1,98E-06
[OI] 63µ	8,64E-04	2,08E-04	2,85E-04	7,57E-04	4,94E-04	3,84E-04	4,98E-05
[OI] 146µ	8,23E-05	7,70E-06	9,65E-06	6,26E-05	8,63E-06	2,02E-05	4,81E-05
[CI] 610µ	1,60E-07	1,57E-06	1,20E-07	3,07E-07	3,03E-07	2,33E-07	2,13E-07
[CI] 370µ	6,78E-07	6,49E-06	5,11E-07	1,30E-06	1,21E-06	9,86E-07	9,00E-07



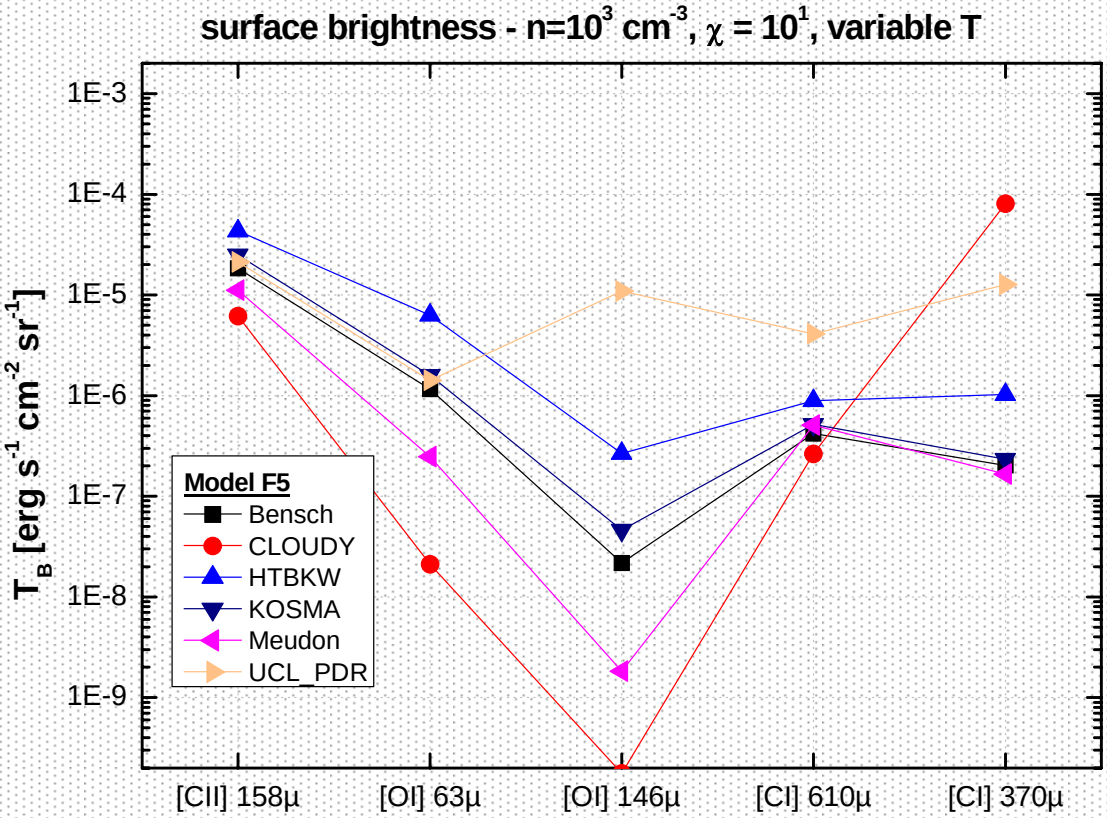
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	2,43E-05	1,37E-05	1,72E-05	3,90E-05	2,58E-05	2,12E-05	3,21E-05
[OI] 63µ	8,62E-04	2,52E-04	2,71E-04	7,67E-04	5,65E-04	3,84E-04	4,98E-04
[OI] 146µ	8,40E-05	1,33E-05	6,11E-06	6,59E-05	1,32E-05	2,02E-05	3,73E-05
[CI] 610µ	1,60E-07	1,20E-06	1,31E-07	2,80E-07	3,25E-07	2,33E-07	6,13E-07
[CI] 370µ	6,78E-07	6,49E-06	5,50E-07	1,18E-06	1,36E-06	9,86E-07	2,58E-06



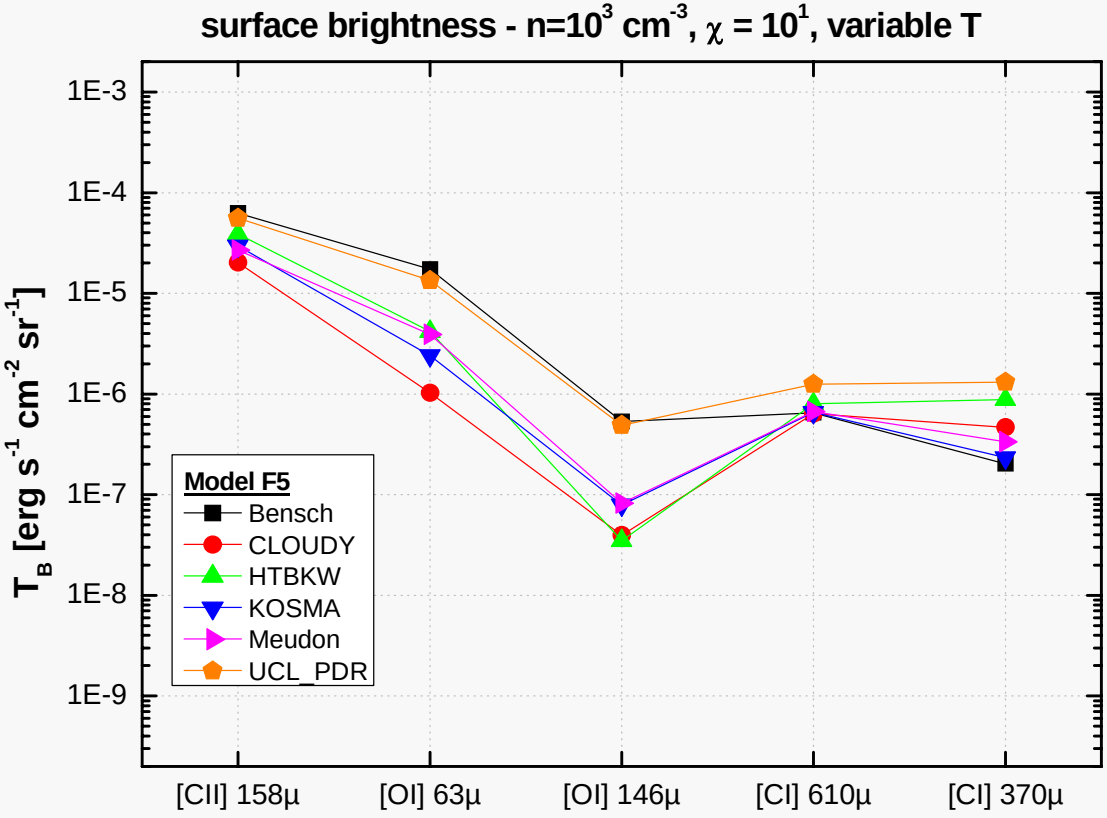
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	2,51E-04	1,59E-04	1,21E-04	3,06E-04	1,85E-04	1,46E-04	1,14E-04
[OI] 63µ	8,78E-04	2,61E-04	2,05E-04	7,88E-04	5,64E-04	3,76E-04	2,42E-04
[OI] 146µ	8,65E-05	1,33E-05	1,42E-05	7,15E-05	1,30E-05	2,76E-05	6,48E-04
[CI] 610µ	2,88E-07	1,80E-06	9,26E-07	5,78E-07	7,33E-07	1,48E-06	1,46E-06
[CI] 370µ	1,22E-04	7,41E-06	3,87E-06	2,44E-06	3,06E-06	6,16E-06	6,04E-06



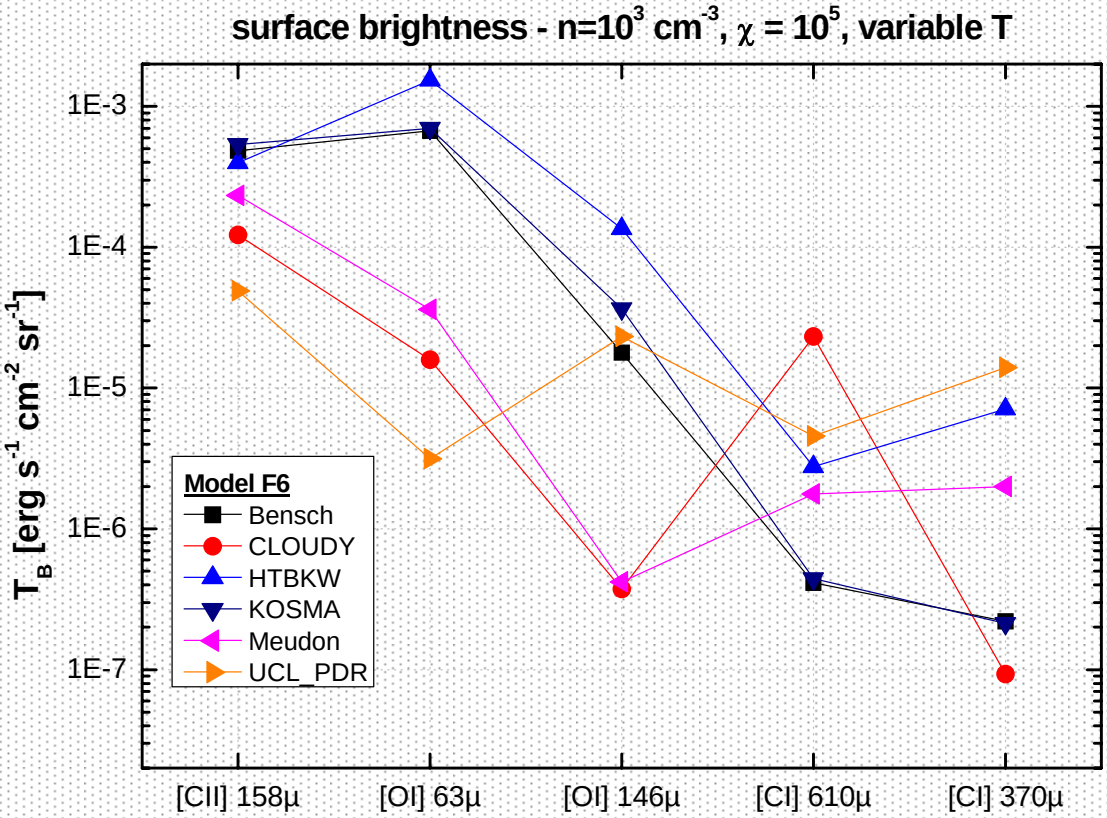
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	Sternberg	UCL_PDR
[CII] 158µ	2,77E-04	1,24E-04	1,23E-04	3,16E-04	1,94E-04	1,46E-04	2,21E-04
[OI] 63µ	8,82E-04	2,70E-04	3,11E-04	8,09E-04	6,14E-04	3,76E-04	5,07E-04
[OI] 146µ	9,06E-05	1,56E-05	1,09E-05	7,82E-05	1,78E-05	2,76E-05	4,16E-05
[CI] 610µ	6,28E-07	1,42E-06	9,20E-07	9,10E-07	6,85E-07	1,48E-06	3,11E-06
[CI] 370µ	1,22E-04	5,89E-06	3,82E-06	2,44E-06	2,86E-06	6,16E-06	1,28E-05



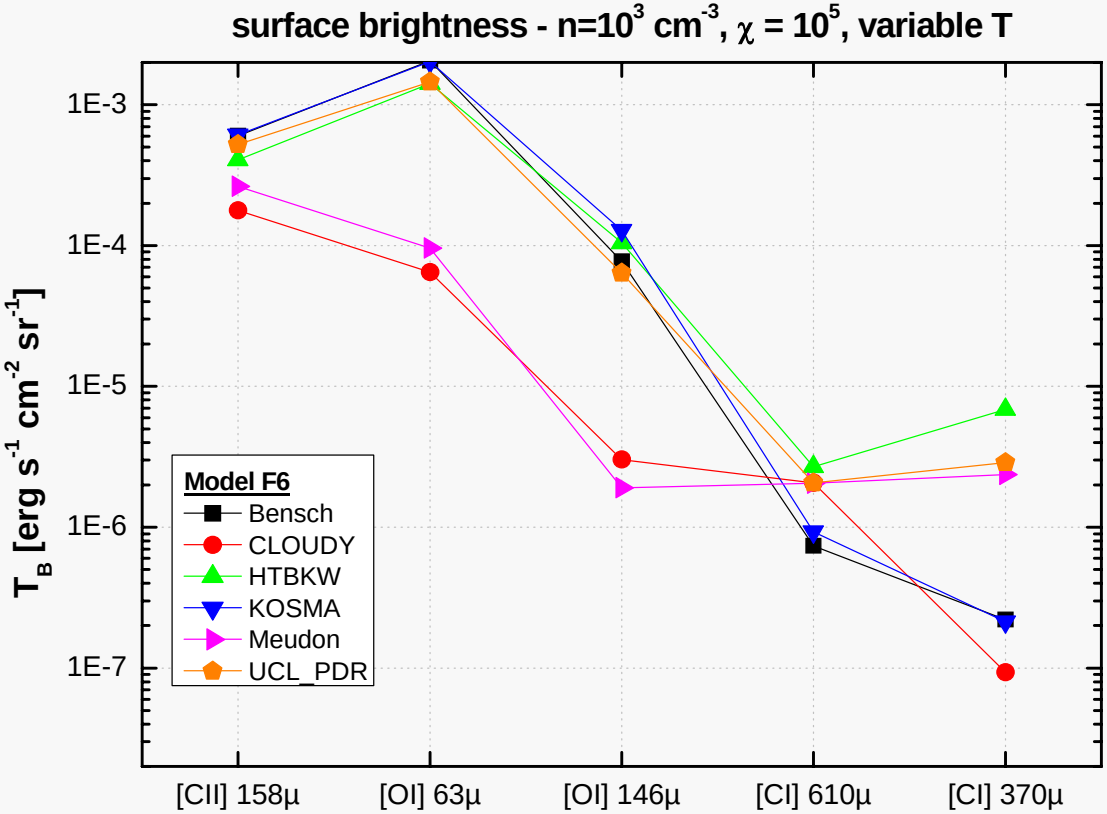
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	1,84E-05	6,20E-06	4,33E-05	2,50E-05	1,11E-05	2,11E-05
[OI] 63µ	1,16E-06	2,11E-08	6,29E-06	1,59E-06	2,46E-07	1,42E-06
[OI] 146µ	2,17E-08	1,77E-10	2,66E-07	4,59E-08	1,82E-09	1,09E-05
[CI] 610µ	4,22E-07	2,64E-07	8,88E-07	5,19E-07	5,10E-07	4,10E-06
[CI] 370µ	2,03E-07	8,10E-05	1,03E-06	2,33E-07	1,65E-07	1,27E-05



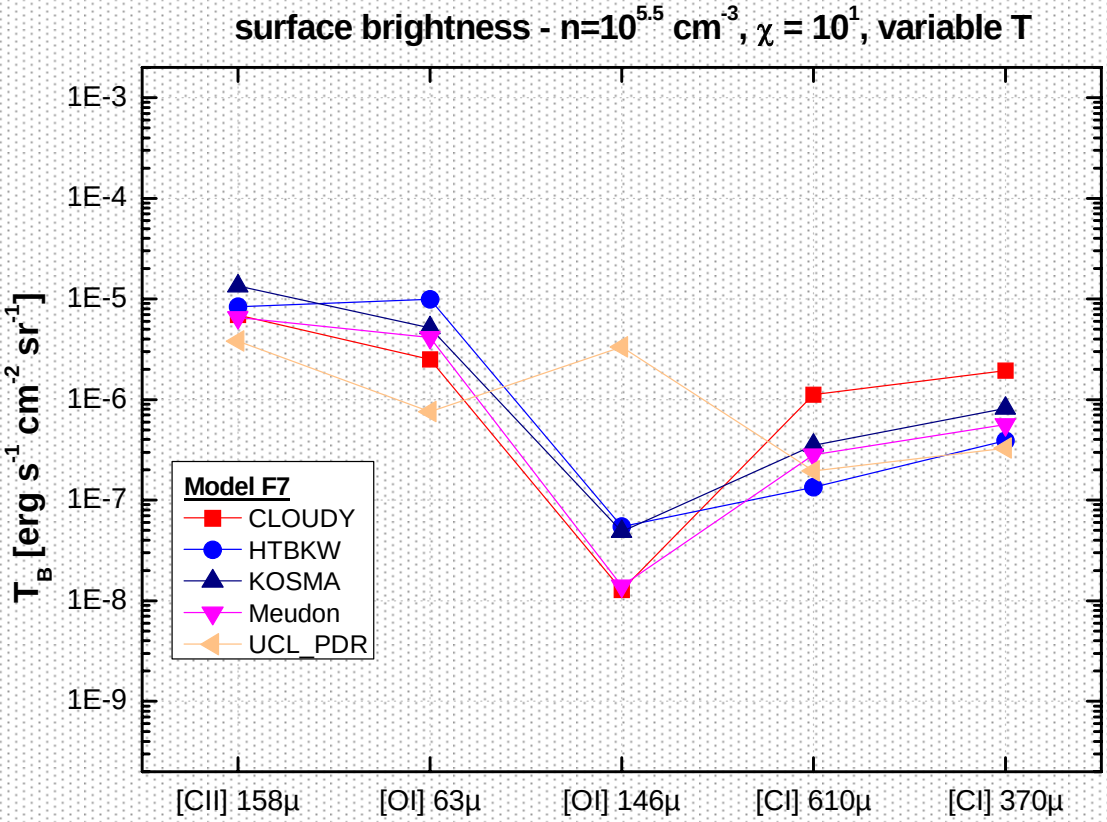
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	6,27E-05	2,02E-05	3,90E-05	2,96E-05	2,68E-05	5,59E-05
[OI] 63µ	1,74E-05	1,03E-06	4,20E-06	2,41E-06	3,90E-06	1,34E-05
[OI] 146µ	5,32E-07	3,97E-08	3,49E-08	7,93E-08	8,21E-08	4,90E-07
[CI] 610µ	6,50E-07	6,38E-07	8,00E-07	6,58E-07	6,70E-07	1,25E-06
[CI] 370µ	2,03E-07	4,67E-07	8,82E-07	2,33E-07	3,35E-07	1,32E-06



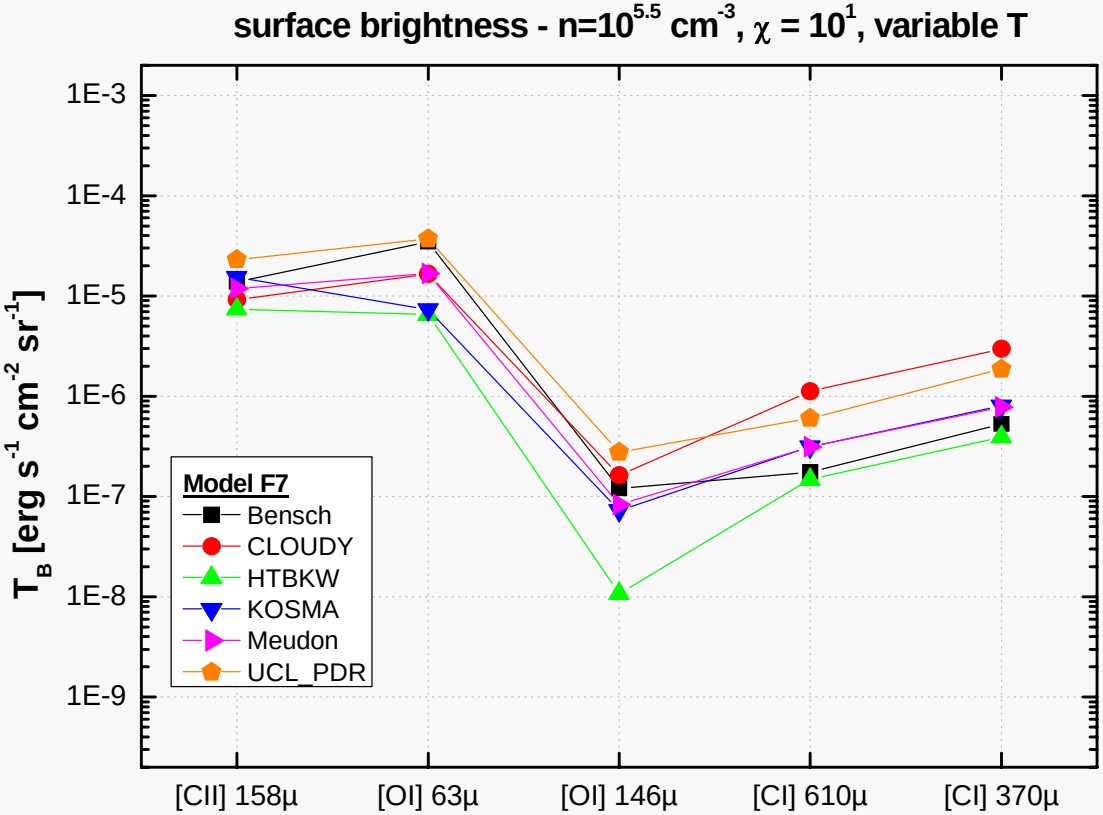
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	4,86E-04	1,22E-04	3,98E-04	5,39E-04	2,34E-04	4,89E-05
[OI] 63µ	6,72E-04	1,59E-05	1,54E-03	6,98E-04	3,61E-05	3,15E-06
[OI] 146µ	1,78E-05	3,74E-07	1,36E-04	3,67E-05	4,20E-07	2,32E-05
[CI] 610µ	4,13E-07	2,32E-05	2,77E-06	4,42E-07	1,76E-06	4,57E-06
[CI] 370µ	2,20E-07	9,34E-08	7,08E-06	2,13E-07	1,99E-06	1,40E-05



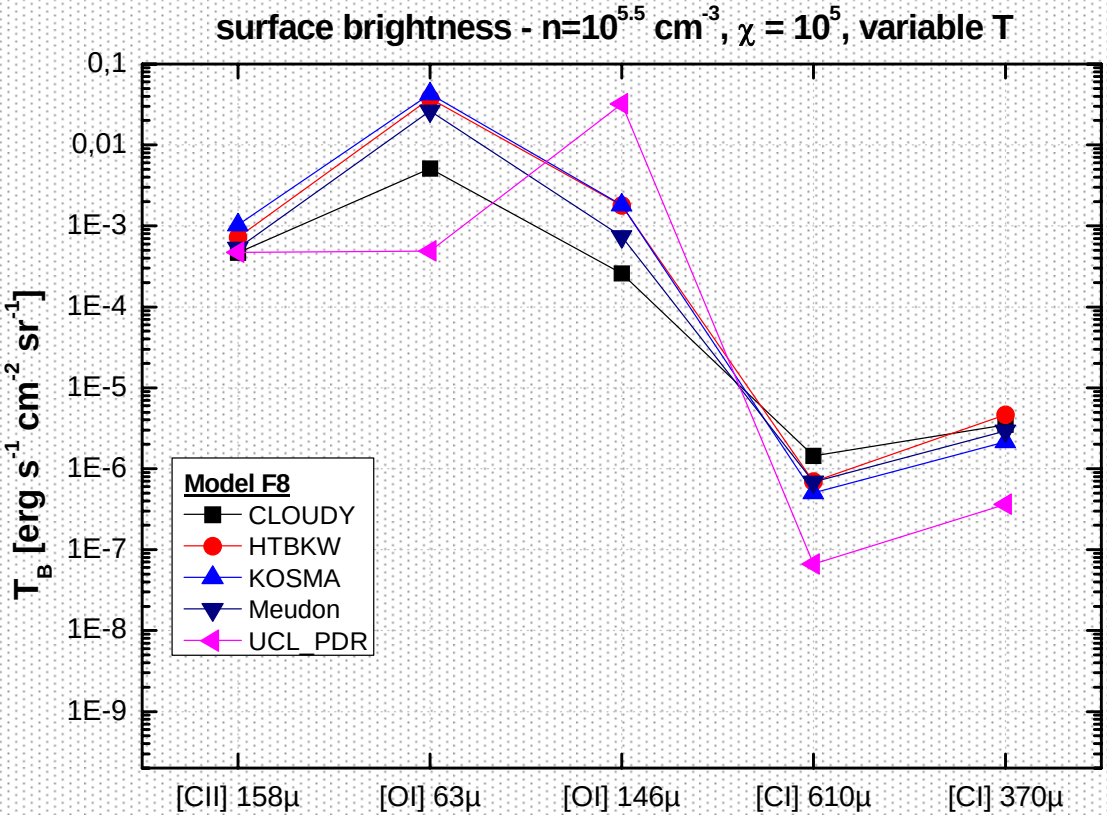
	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	6,01E-04	1,78E-04	4,06E-04	6,11E-04	2,64E-04	5,23E-04
[OI] 63µ	2,06E-03	6,49E-05	1,41E-03	2,03E-03	9,60E-05	1,46E-03
[OI] 146µ	7,73E-05	3,02E-06	1,05E-04	1,29E-04	1,91E-06	6,40E-05
[CI] 610µ	7,38E-07	2,07E-06	2,70E-06	9,27E-07	2,05E-06	2,07E-06
[CI] 370µ	2,20E-07	9,34E-08	6,87E-06	2,13E-07	2,37E-06	2,89E-06



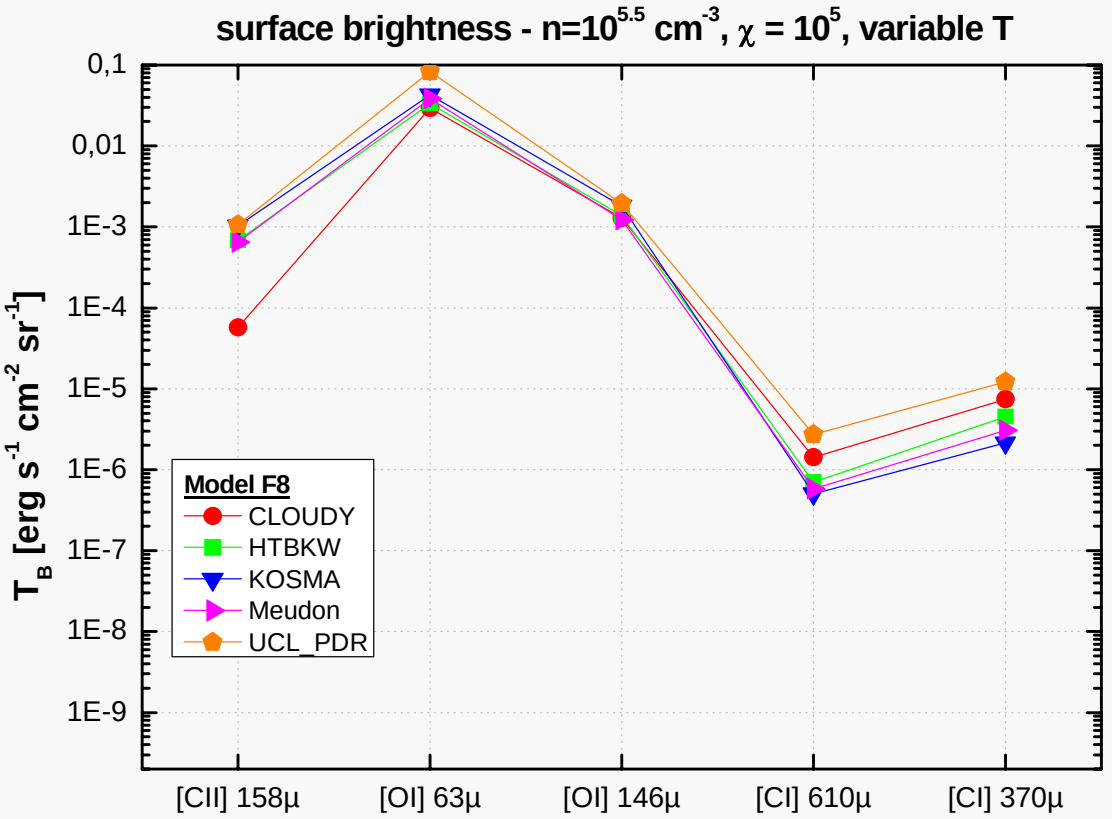
	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	6,92E-06	8,32E-06	1,35E-05	6,51E-06	3,80E-06
[OI] 63µ	2,50E-06	9,92E-06	5,14E-06	4,13E-06	7,57E-07
[OI] 146µ	1,28E-08	5,44E-08	4,89E-08	1,41E-08	3,32E-06
[CI] 610µ	1,12E-06	1,35E-07	3,52E-07	2,83E-07	1,94E-07
[CI] 370µ	1,93E-06	3,90E-07	8,19E-07	5,67E-07	3,29E-07



	Bensch	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	1,38E-05	9,21E-06	7,41E-06	1,53E-05	1,19E-05	2,30E-05
[OI] 63µ	3,46E-05	1,66E-05	6,55E-06	7,34E-06	1,67E-05	3,70E-05
[OI] 146µ	1,20E-07	1,62E-07	1,08E-08	7,27E-08	8,27E-08	2,77E-07
[CI] 610µ	1,76E-07	1,12E-06	1,49E-07	3,12E-07	3,13E-07	6,01E-07
[CI] 370µ	5,27E-07	2,98E-06	3,94E-07	8,05E-07	7,82E-07	1,86E-06



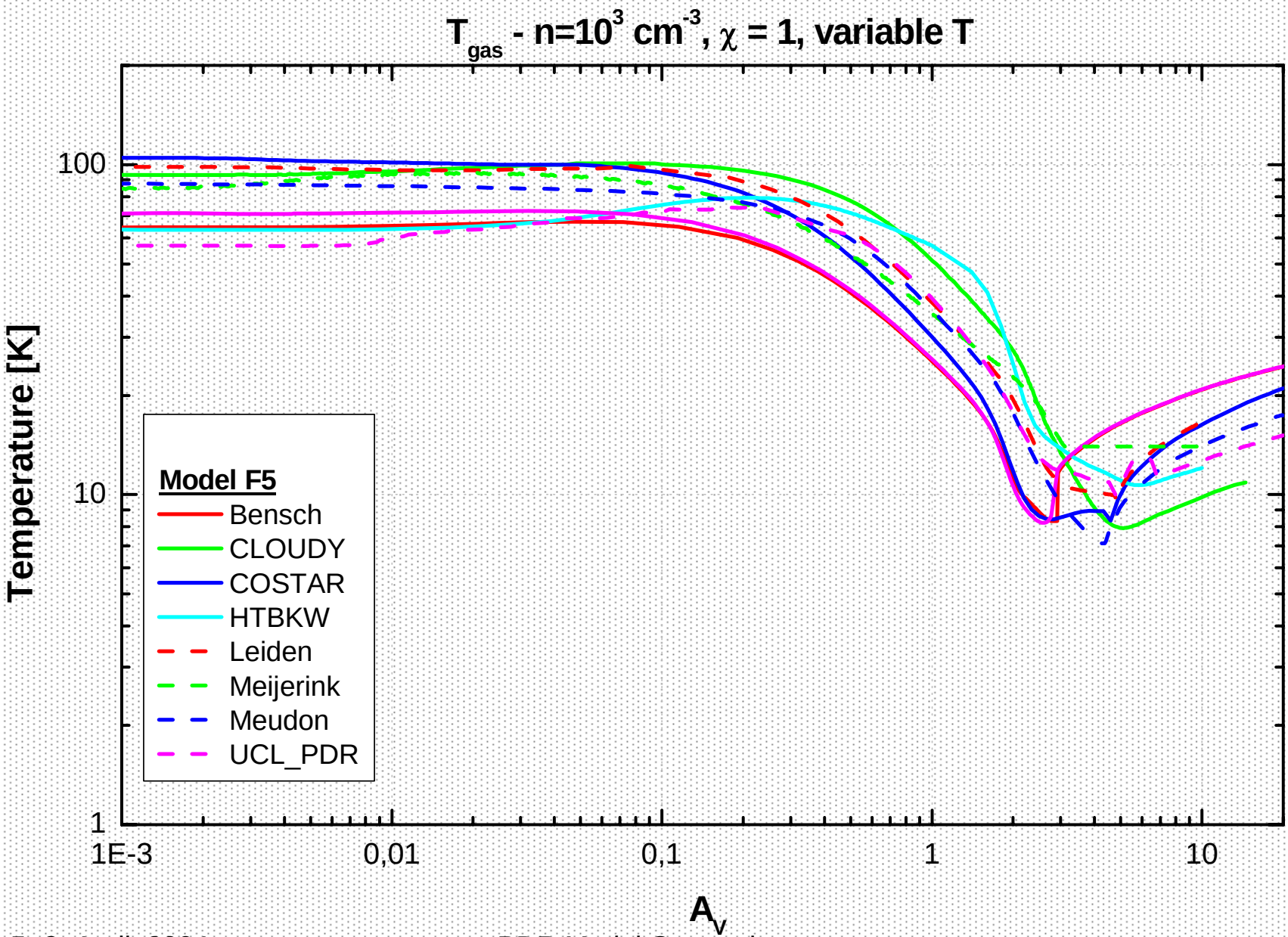
	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	4,65E-04	7,18E-04	1,03E-03	5,32E-04	4,72E-04
[OI] 63µ	5,10E-03	3,76E-02	4,28E-02	2,65E-02	4,91E-04
[OI] 146µ	2,58E-04	1,80E-03	1,80E-03	7,36E-04	3,22E-02
[CI] 610µ	1,45E-06	6,96E-07	5,03E-07	6,85E-07	6,62E-08
[CI] 370µ	3,49E-06	4,65E-06	2,15E-06	2,94E-06	3,64E-07

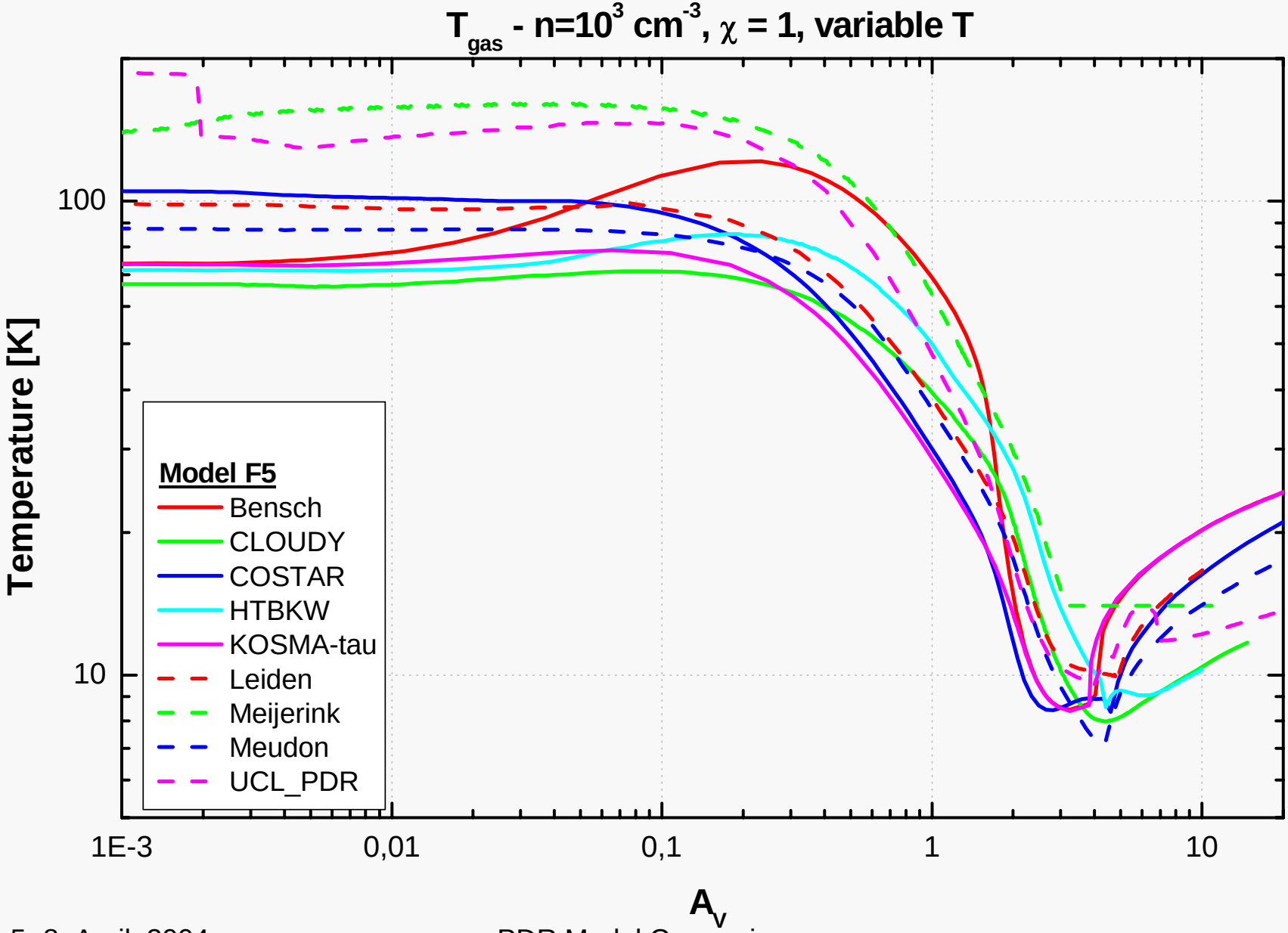


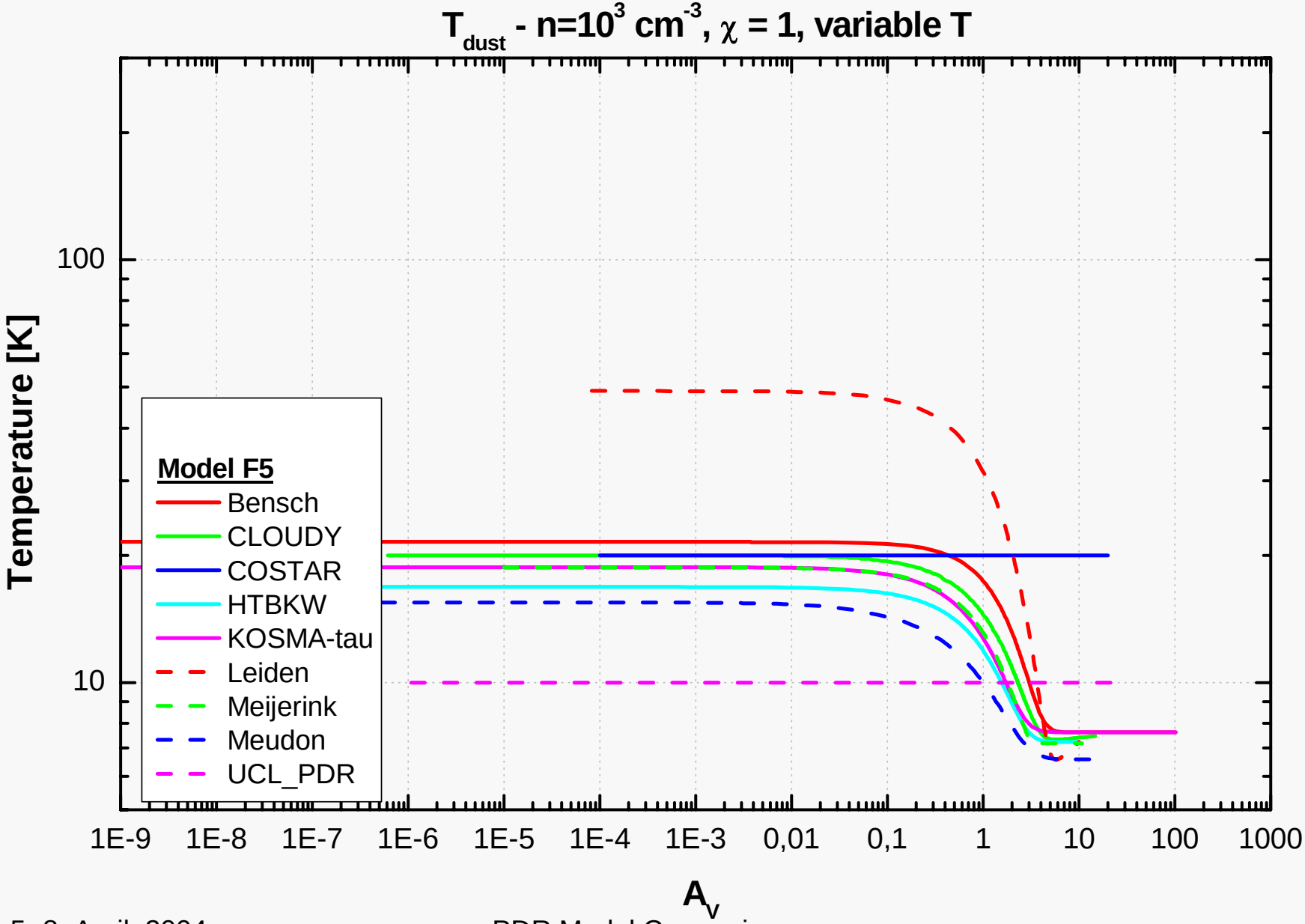
	CLOUDY	HTBKW	KOSMA	Meudon	UCL_PDR
[CII] 158µ	5,74E-05	6,81E-04	1,03E-03	6,50E-04	1,07E-03
[OI] 63µ	2,92E-02	3,34E-02	4,28E-02	3,85E-02	8,29E-02
[OI] 146µ	1,28E-03	1,39E-03	1,80E-03	1,23E-03	1,95E-03
[CI] 610µ	1,42E-06	7,01E-07	5,03E-07	5,79E-07	2,73E-06
[CI] 370µ	7,41E-06	4,54E-06	2,15E-06	3,06E-06	1,22E-05

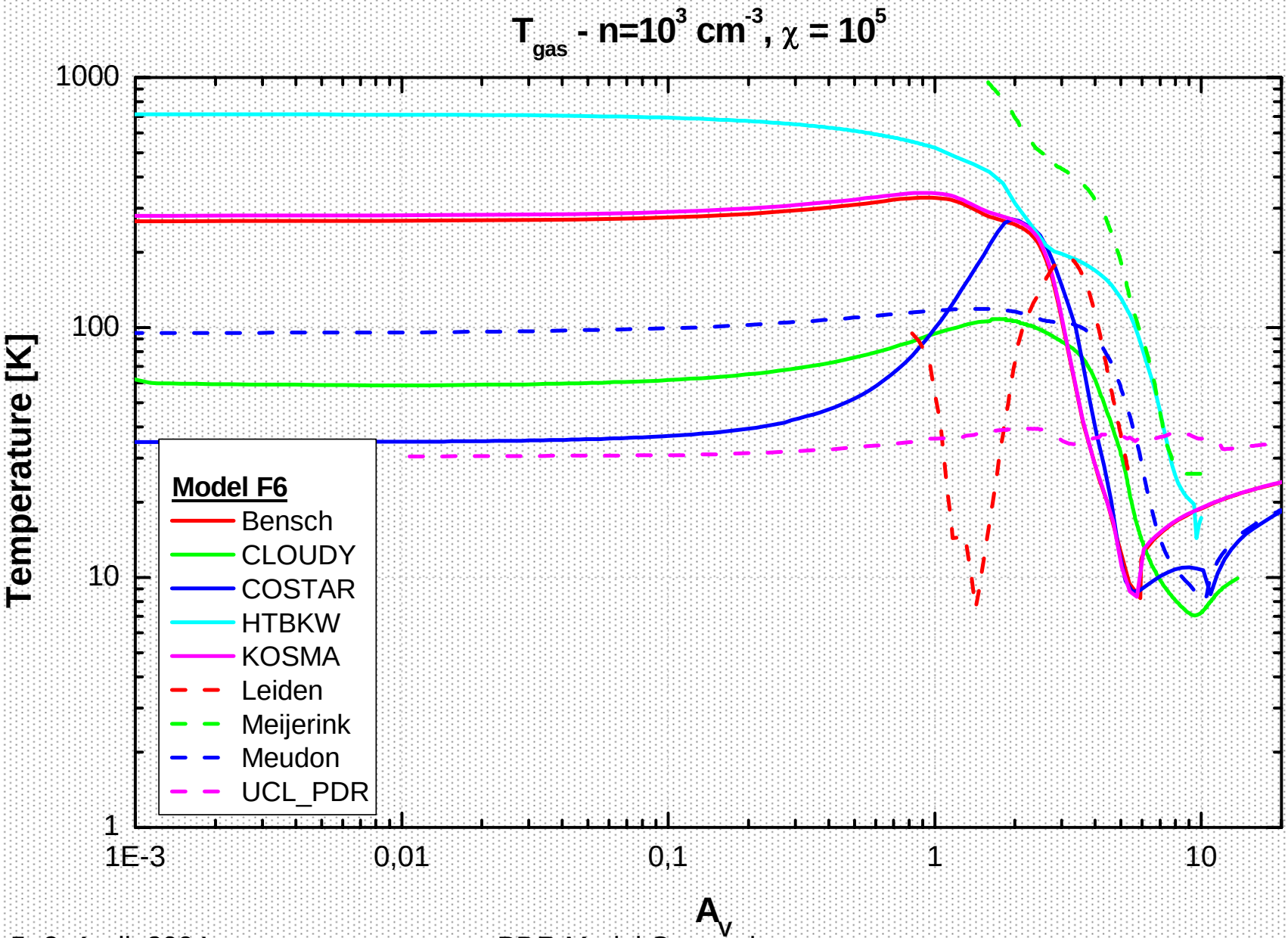
Model Results F5-F8

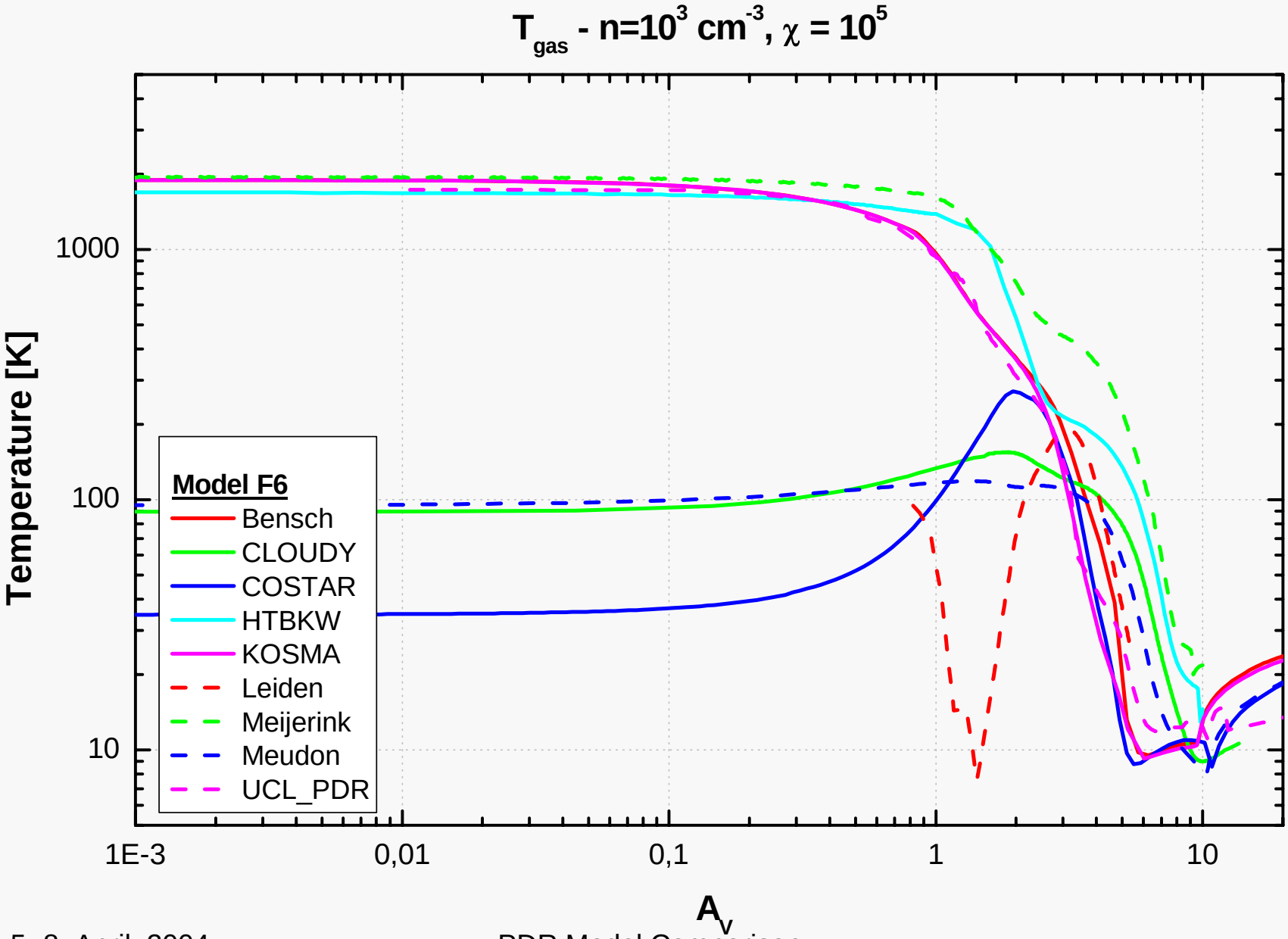
- temperatures

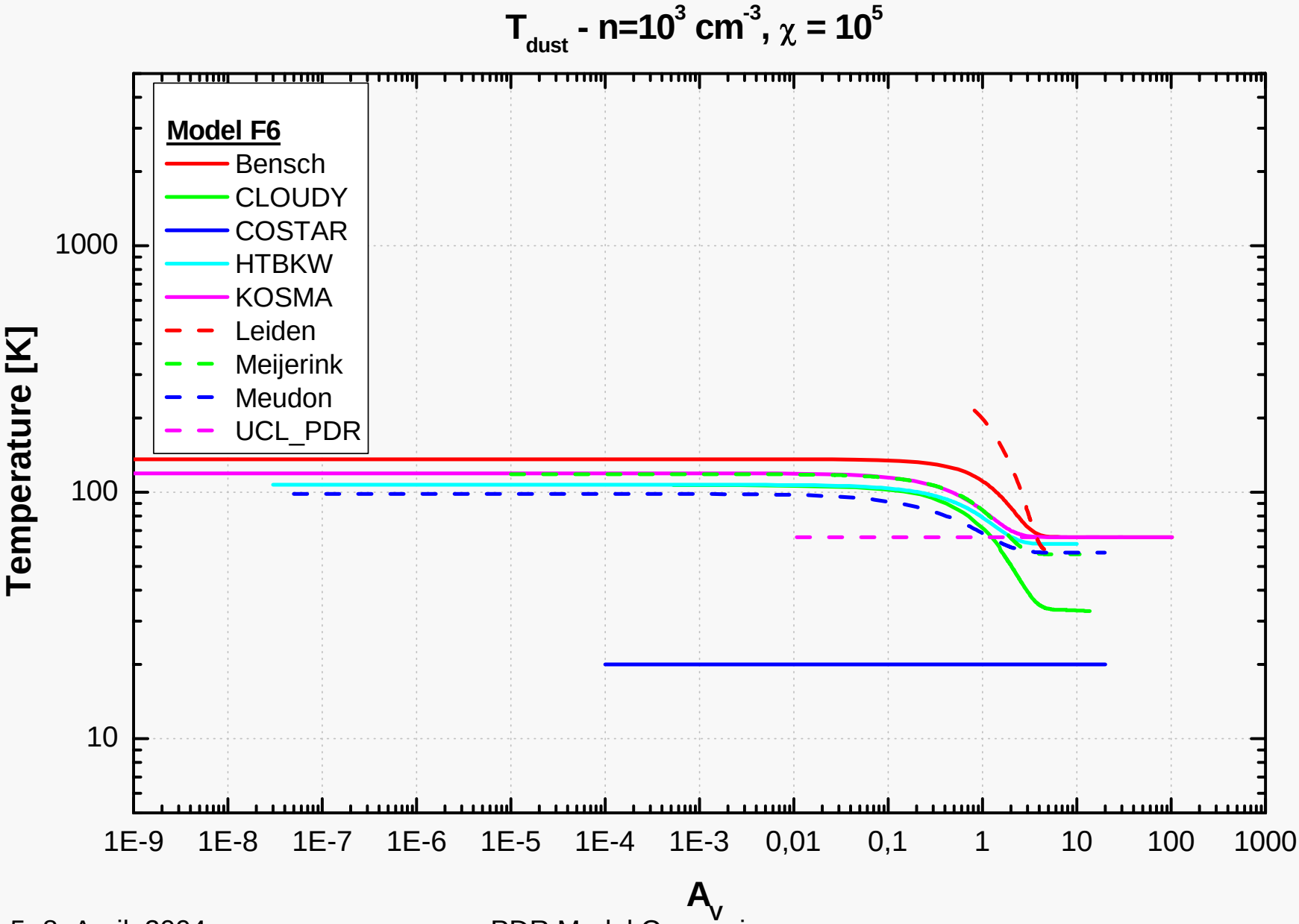

T_{gas} - $n=10^3$ cm^{-3}, χ = 1, variable T
Temperature [K]
100
10
1
1E-3
0,01
0,1
1
10
A_V
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
Leiden
Meijerink
Meudon
UCL_PDR

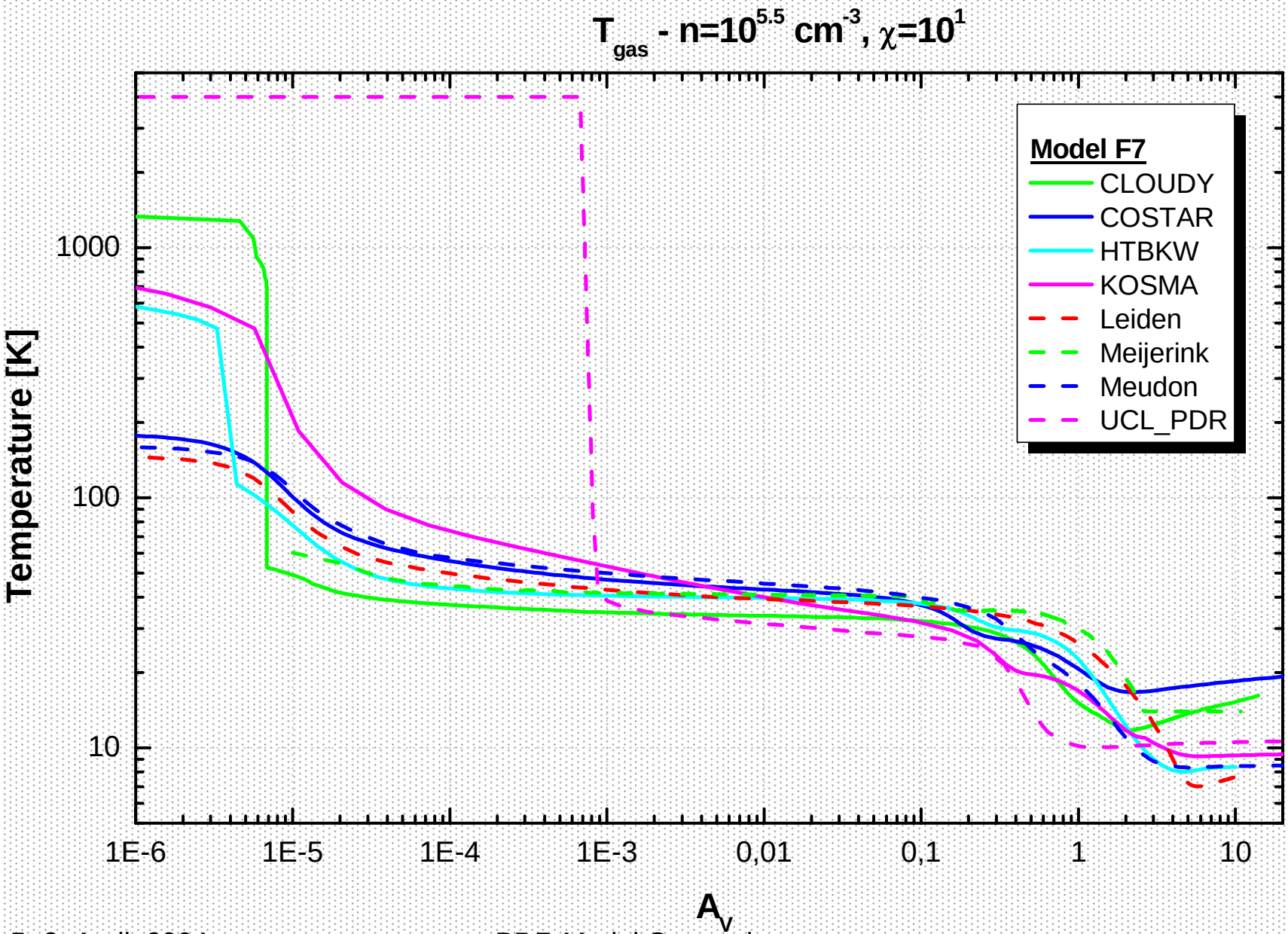

T_{gas} - n=10^3 cm^{-3}, χ = 1, variable T
Temperature [K]
100
10
1E-3
0,01
0,1
1
10
A_V
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA-tau
Leiden
Meijerink
Meudon
UCL_PDR

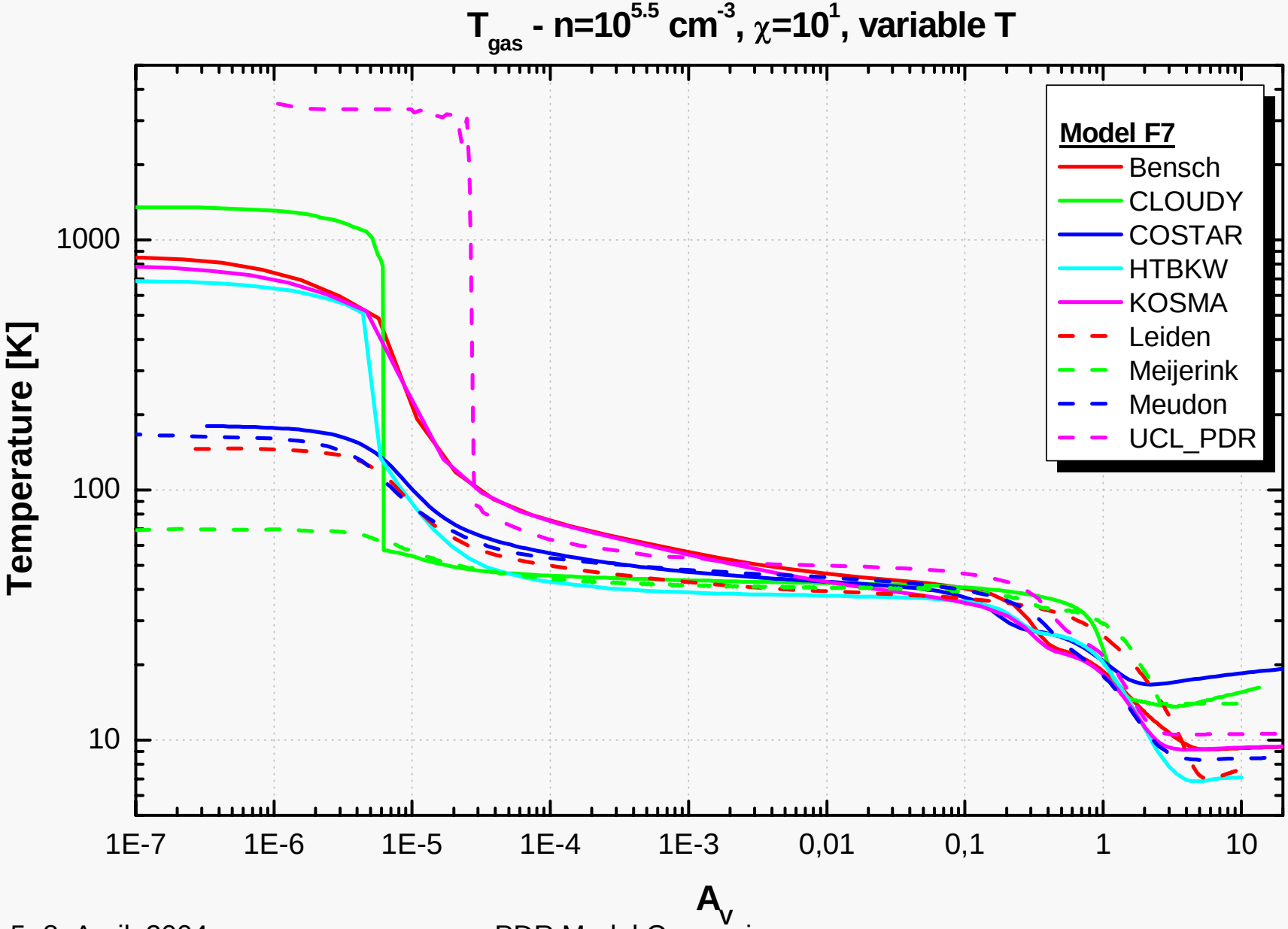

T_{dust} - $n=10^3$ cm^{-3}, χ = 1, variable T
Temperature [K]
100
10
Model F5
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA-tau
Leiden
Meijerink
Meudon
UCL_PDR
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
100
1000
A_V

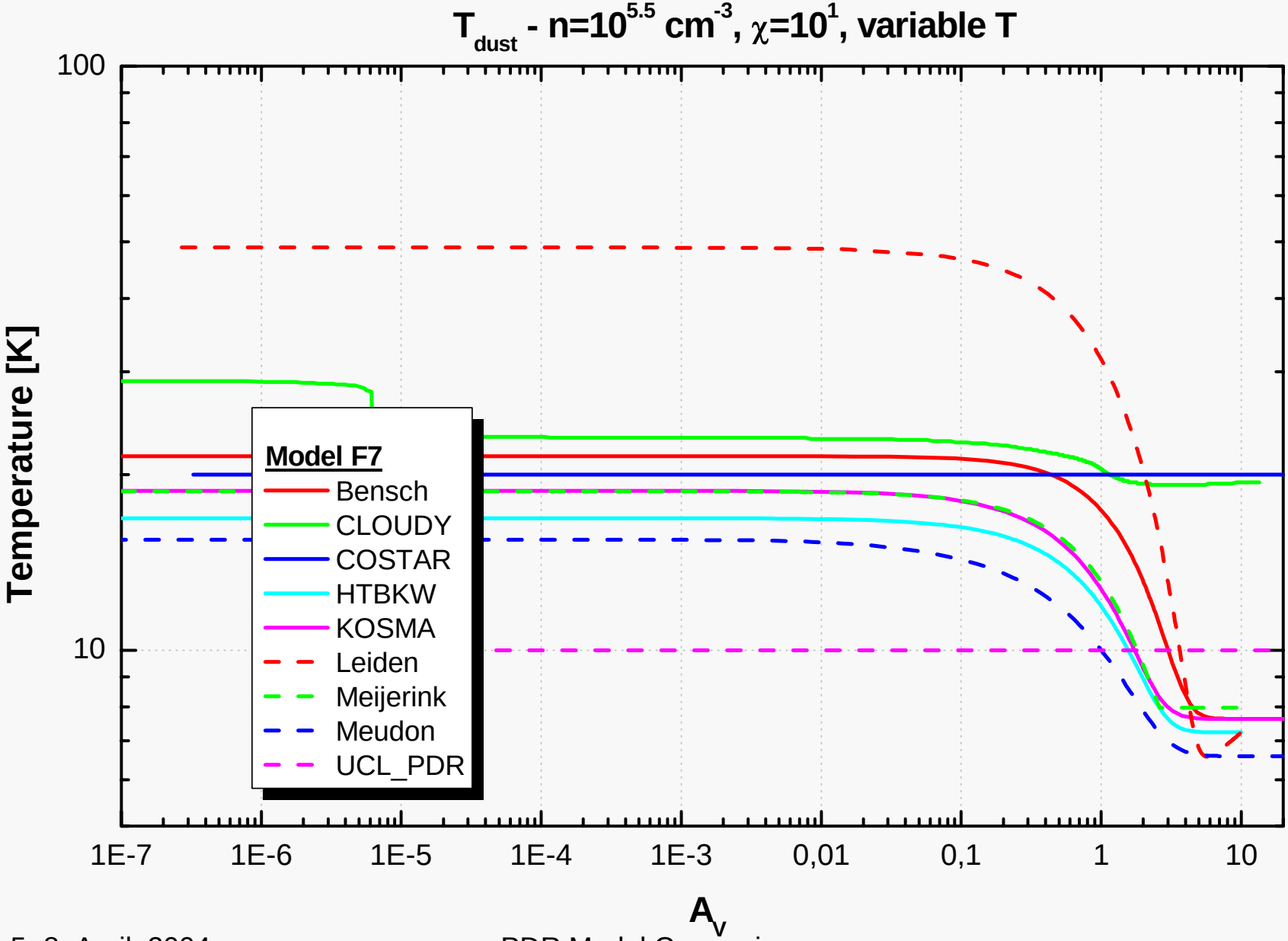

T_{gas} - n=10^3 cm^{-3}, χ = 10^5
1000
100
10
1
Temperature [K]
1E-3
0,01
0,1
1
10
A_V
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

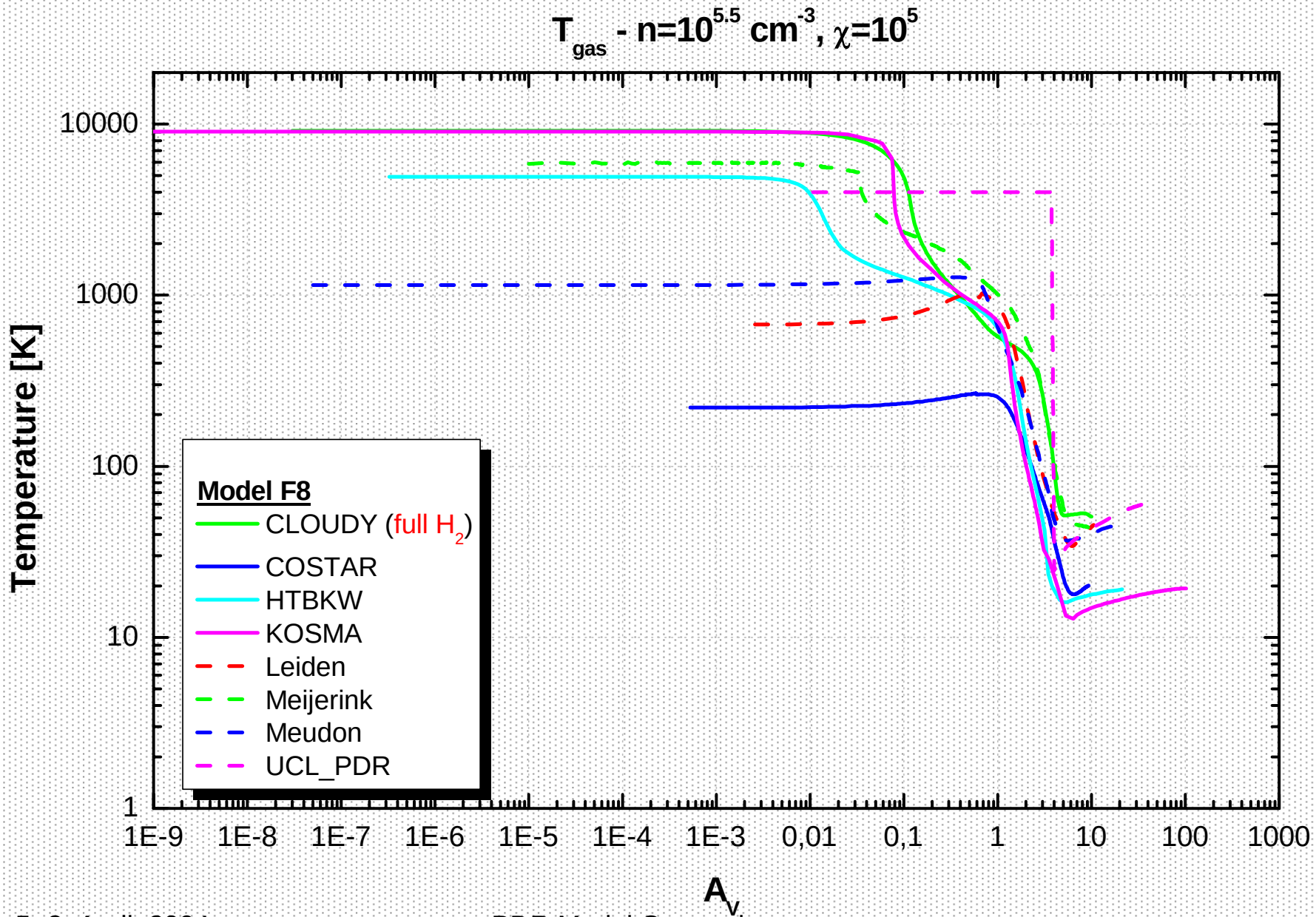

T_{gas} - n=10^3 cm^{-3}, χ = 10^5
Temperature [K]
1000
100
10
1E-3
0,01
0,1
1
10
A_V
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

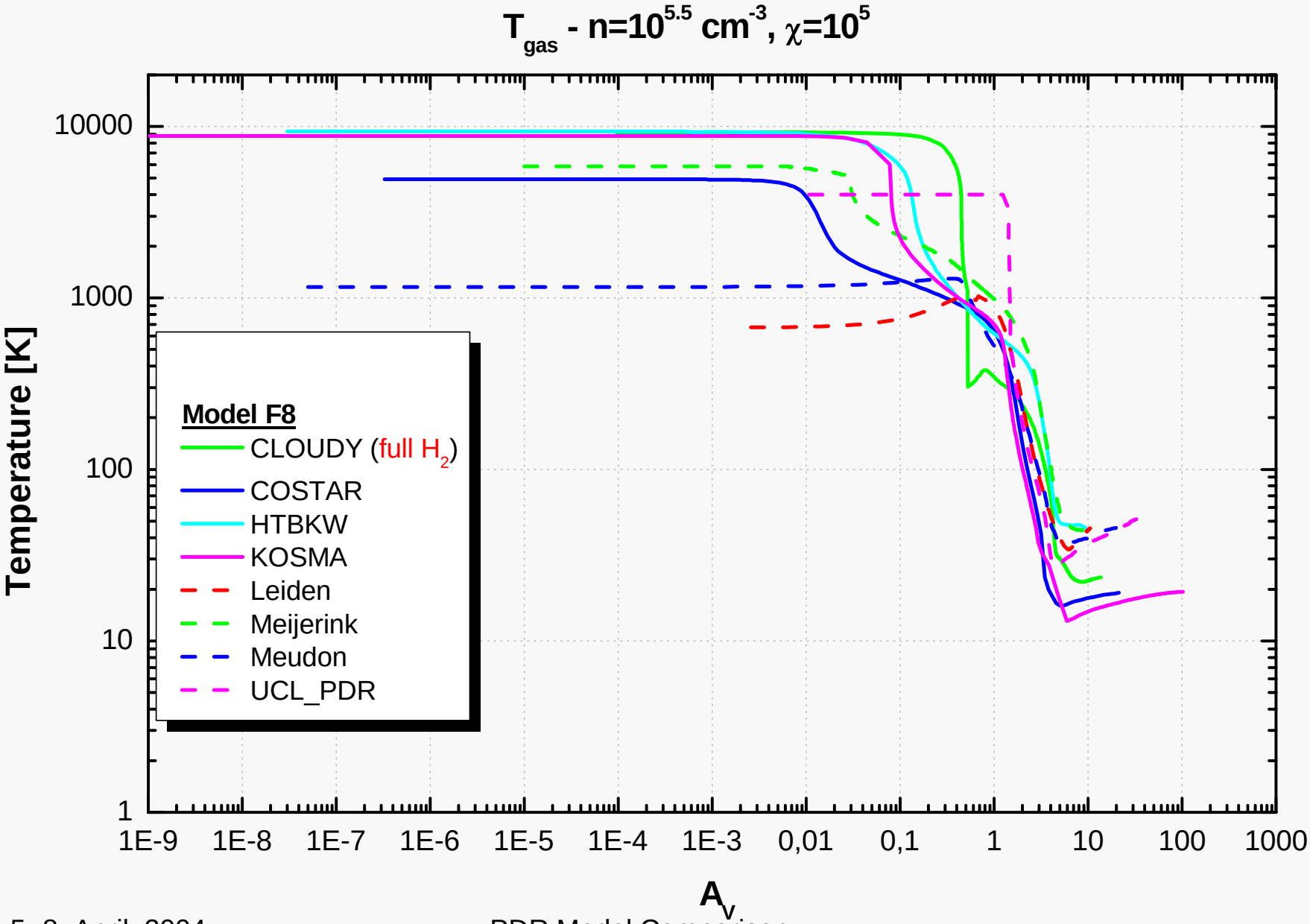

T_{dust} - n=10^3 cm^{-3}, χ = 10^5
Model F6
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
Temperature [K]
1000
100
10
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
100
1000
A_V

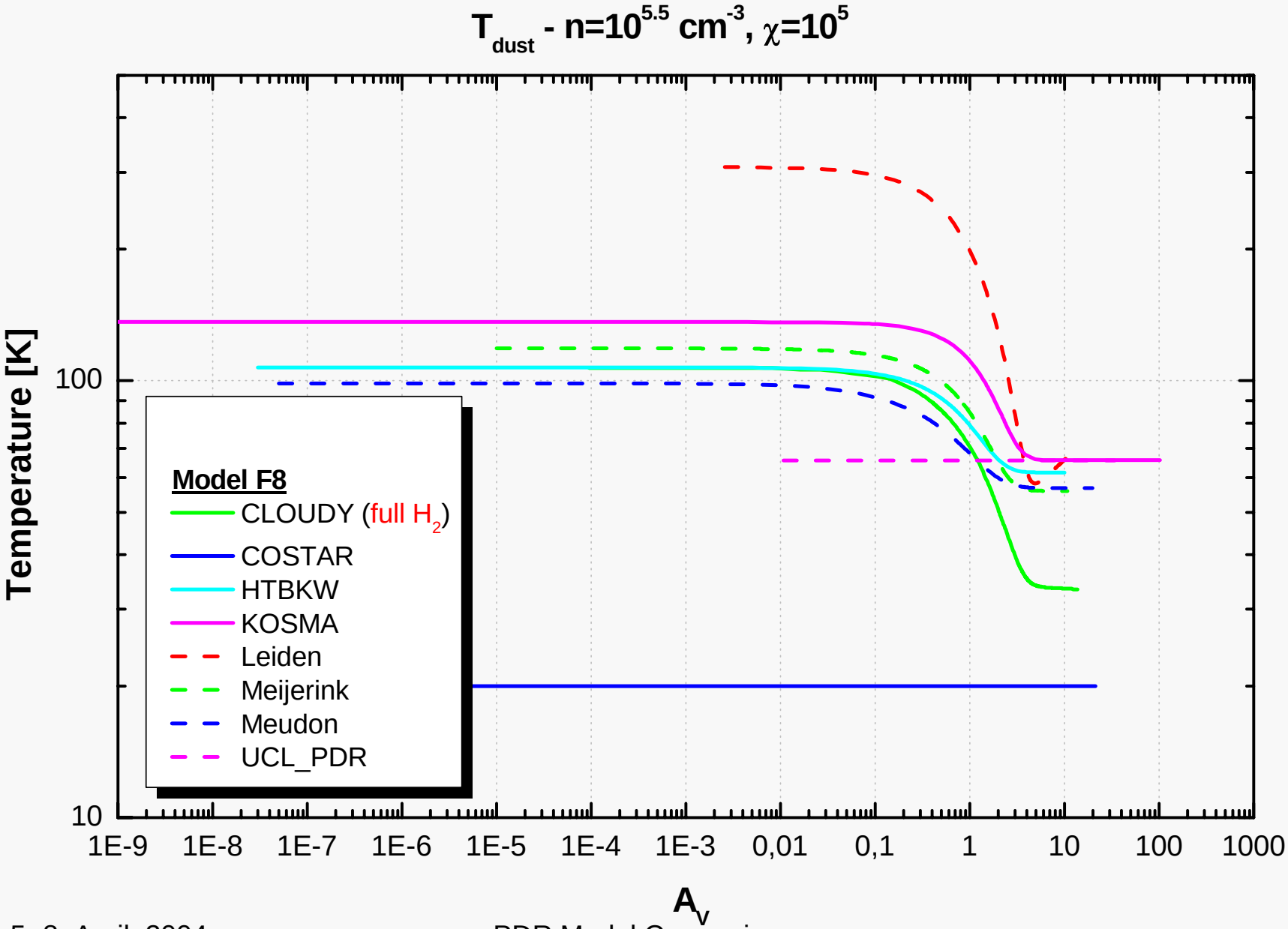

T_{gas} - $n=10^{5.5}$ cm^{-3}, $\chi=10^{1}$
Model F7
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
Temperature [K]
1000
100
10
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V


T_{gas} - n=$10^{5.5}$ cm^{-3}, χ=10^{1}, variable T
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
Temperature [K]
1000
100
10
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

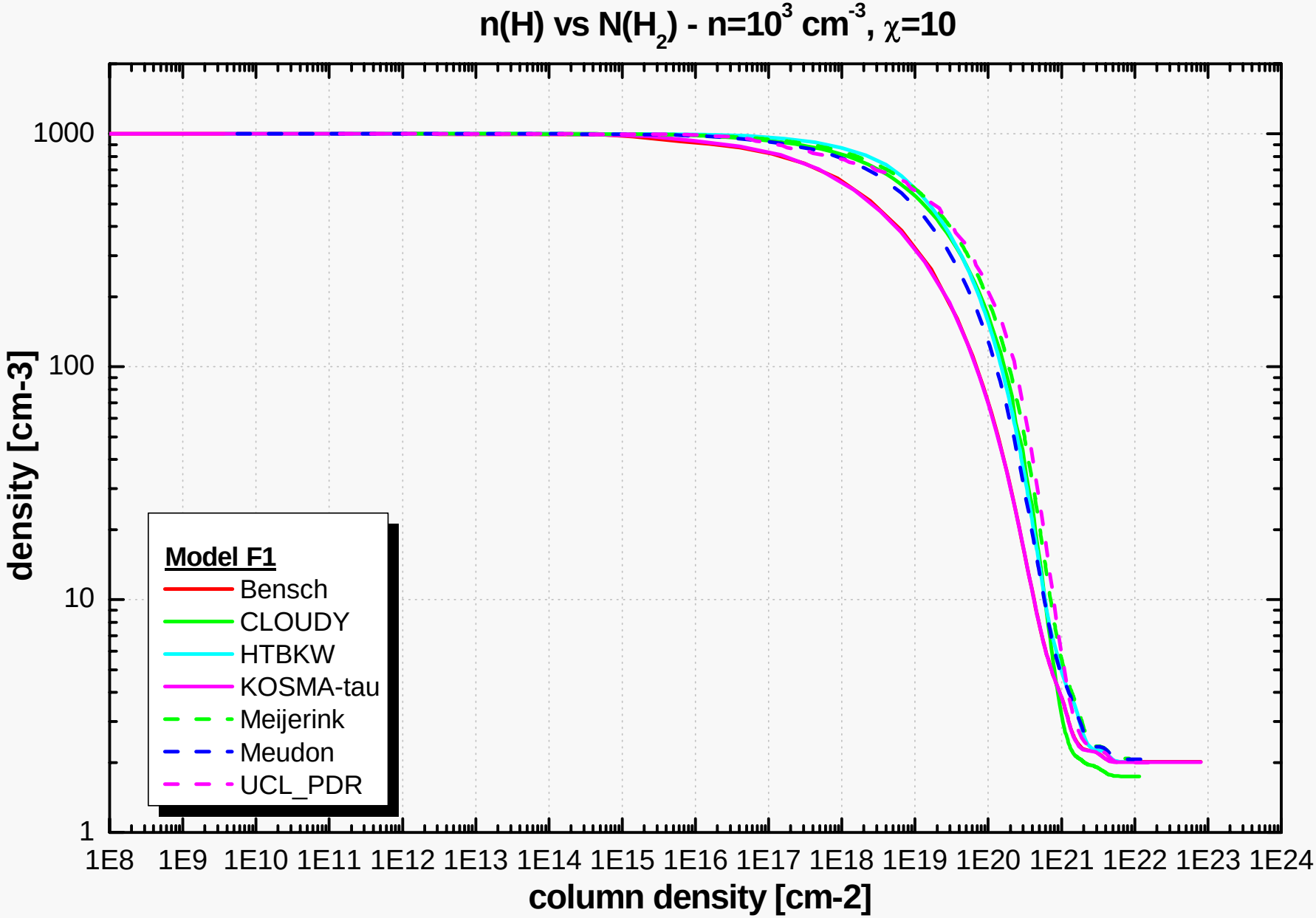

T_{dust} - $n=10^{5.5}$ cm^{-3}, $\chi=10^{1}$, variable T
100
10
Temperature [K]
Model F7
Bensch
CLOUDY
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
A_V

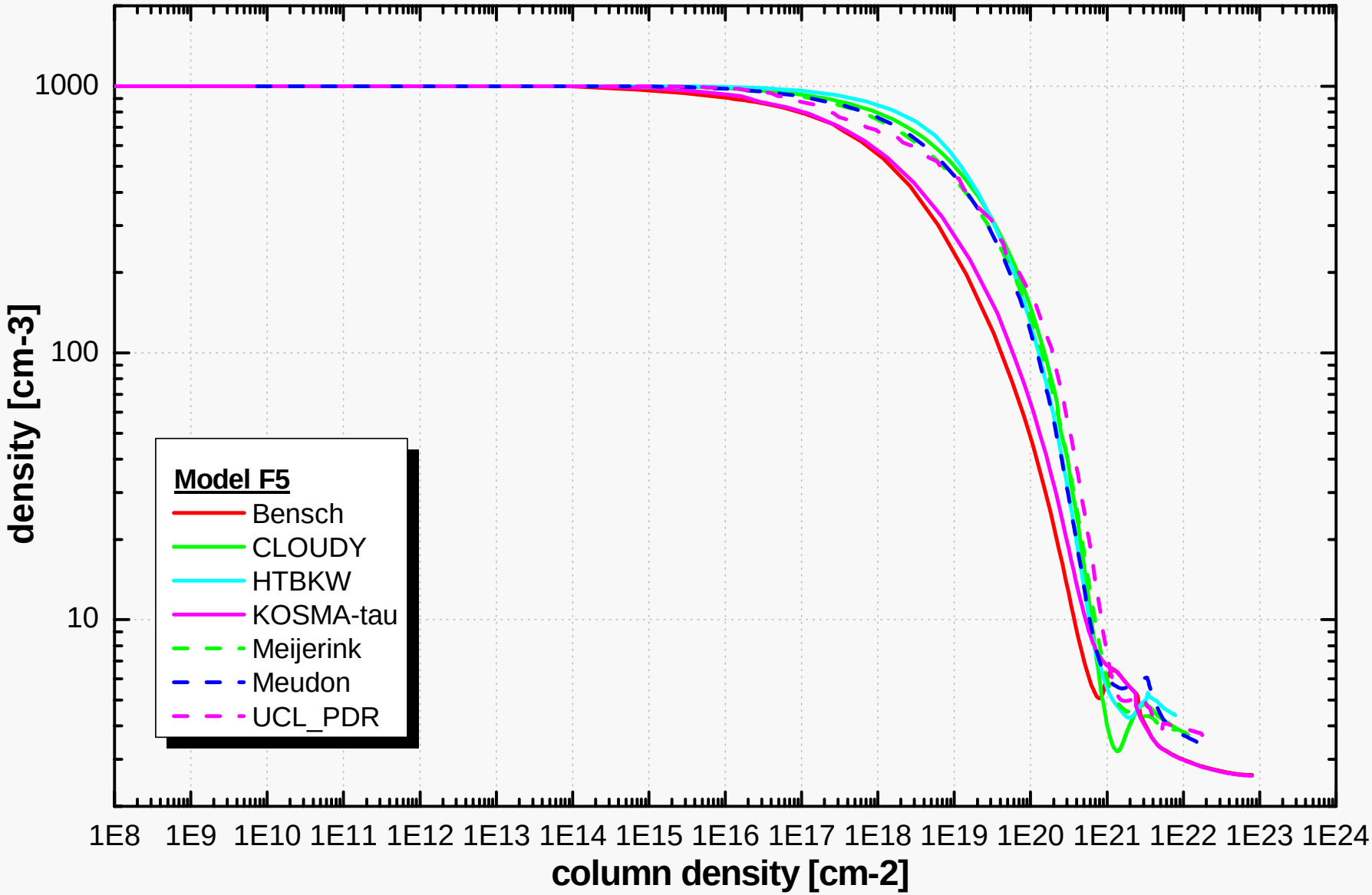

T gas - n=10^5.5 cm^-3, χ=10^5
Temperature [K]
10000
1000
100
10
1
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
100
1000
A_V
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

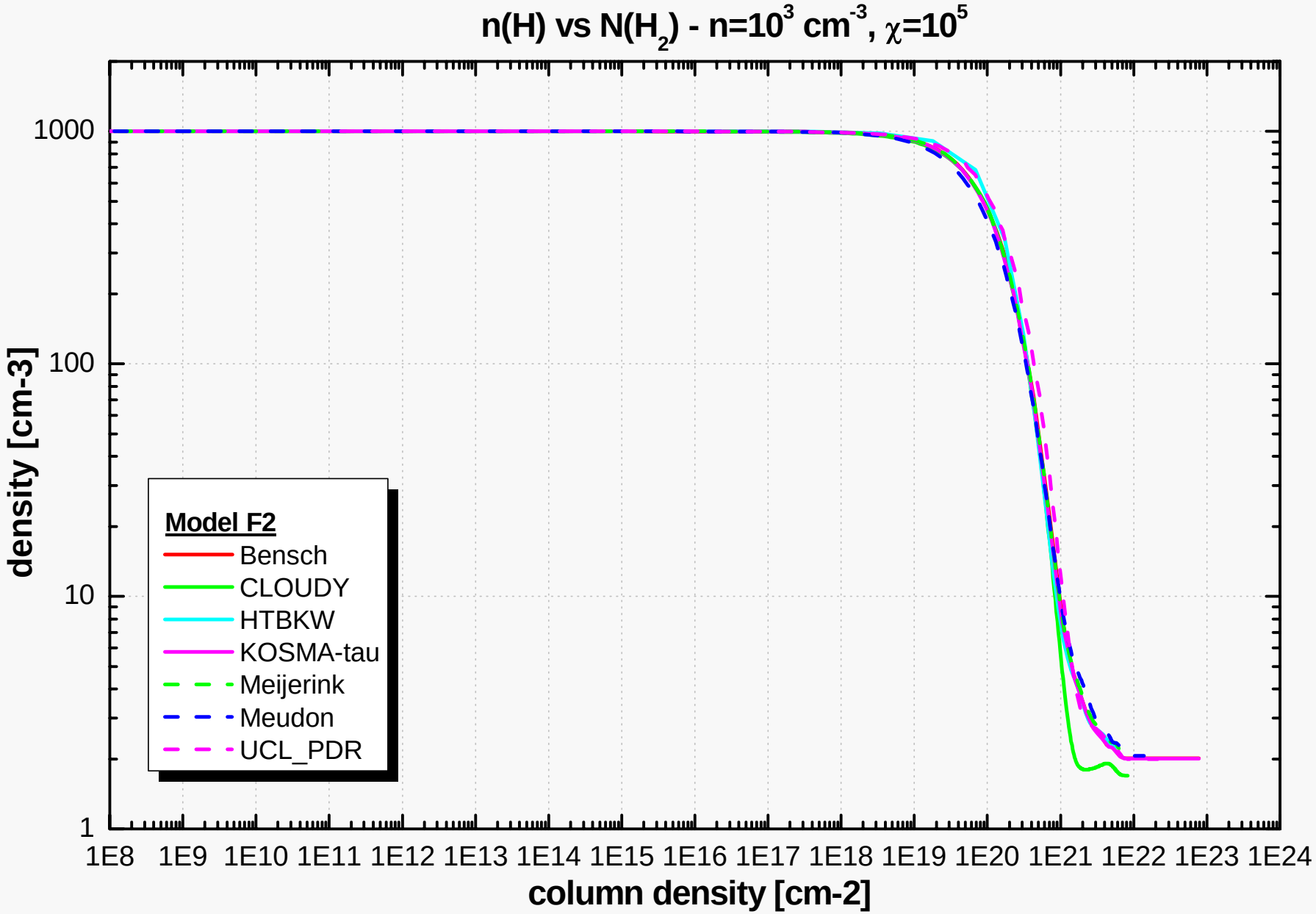

T_{gas} - $n=10^{5.5}$ cm^{-3}, $\chi=10^5$
Temperature [K]
10000
1000
100
10
1
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
100
1000
A_V
Model F8
CLOUDY (full H_2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR

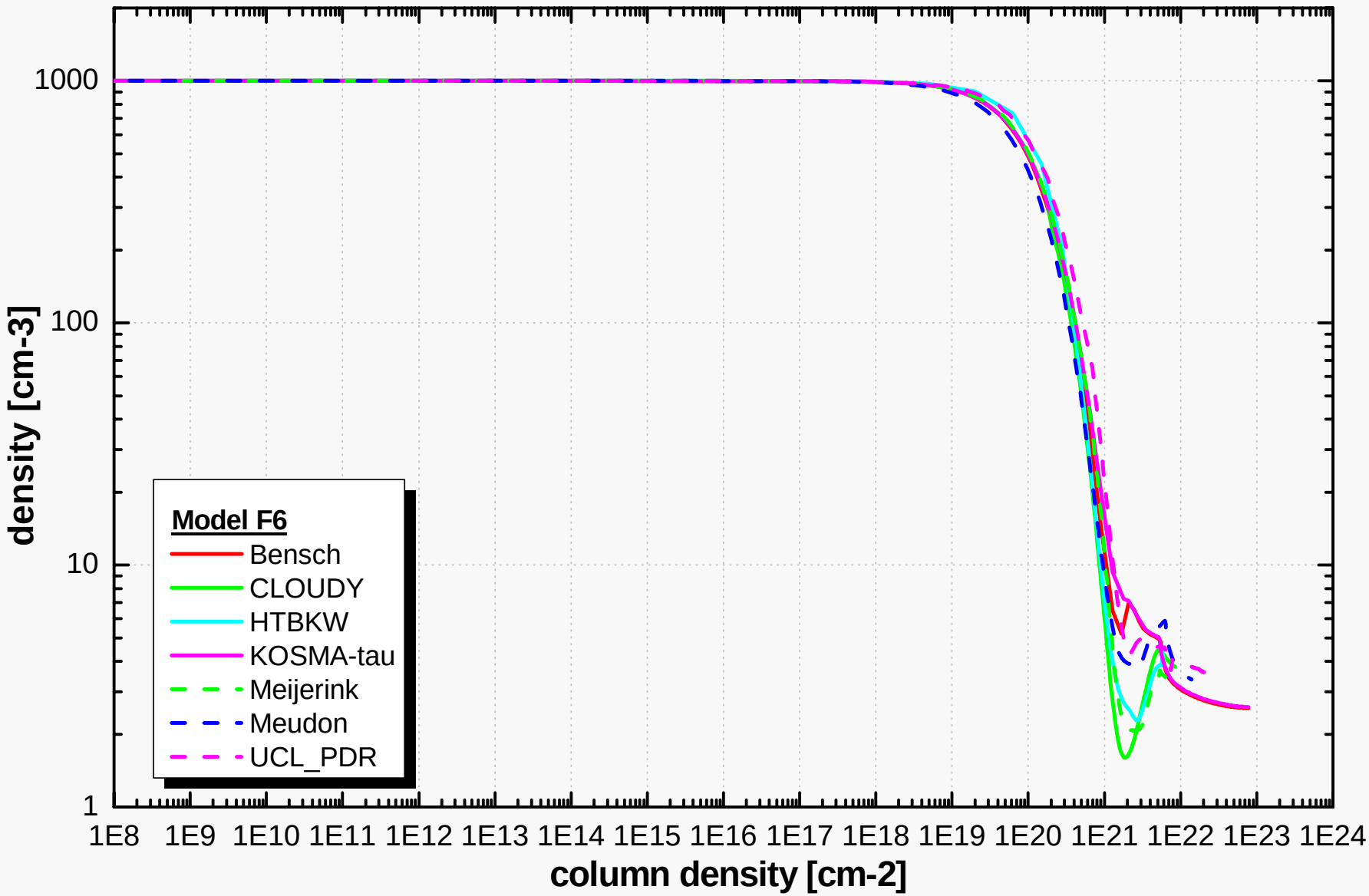

T dust - n=10^5.5 cm^-3, χ=10^5
Temperature [K]
100
10
Model F8
CLOUDY (full H2)
COSTAR
HTBKW
KOSMA
Leiden
Meijerink
Meudon
UCL_PDR
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3
0,01
0,1
1
10
100
1000
A V

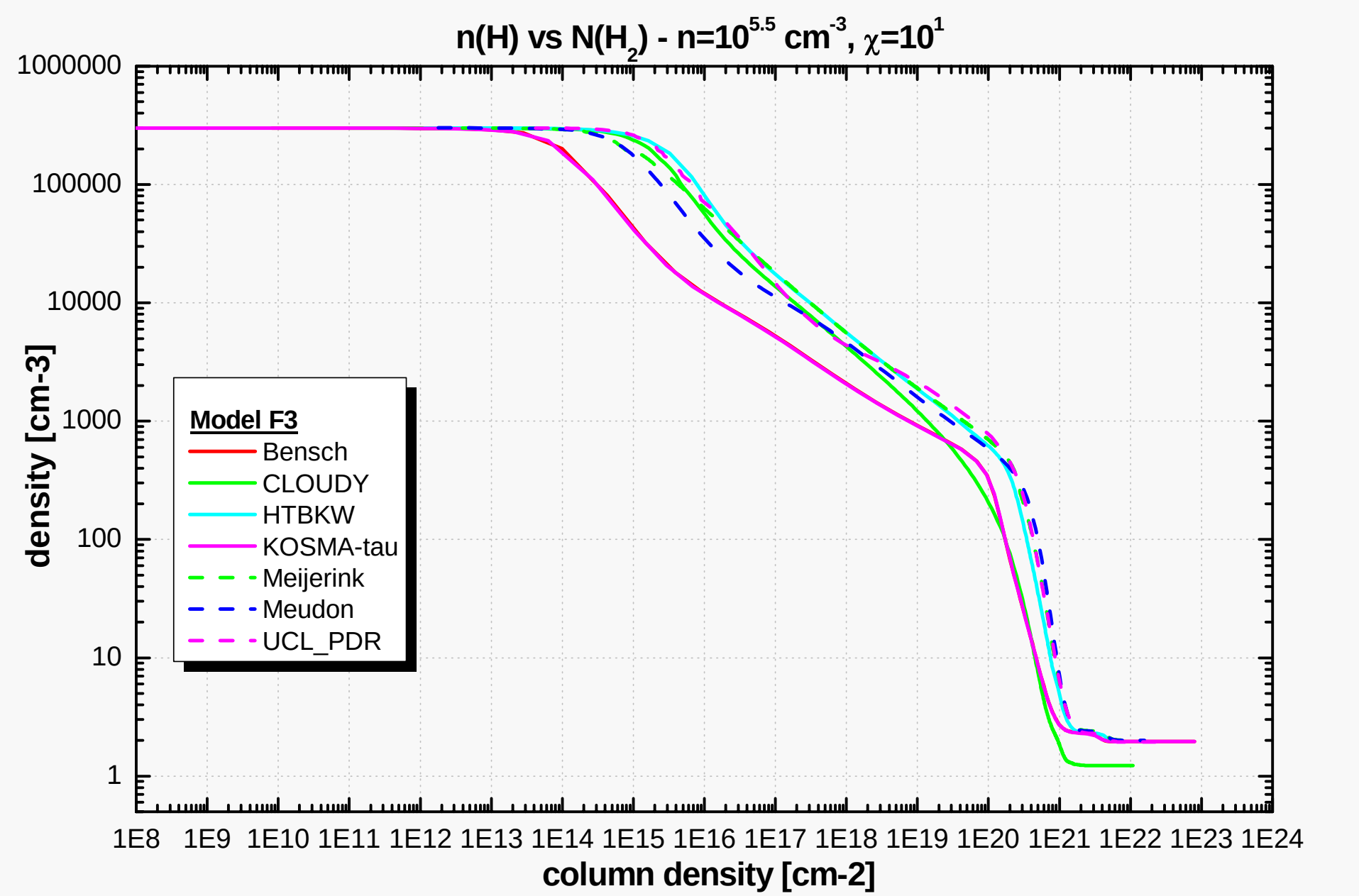
n(H) vs. $N(H_2)$

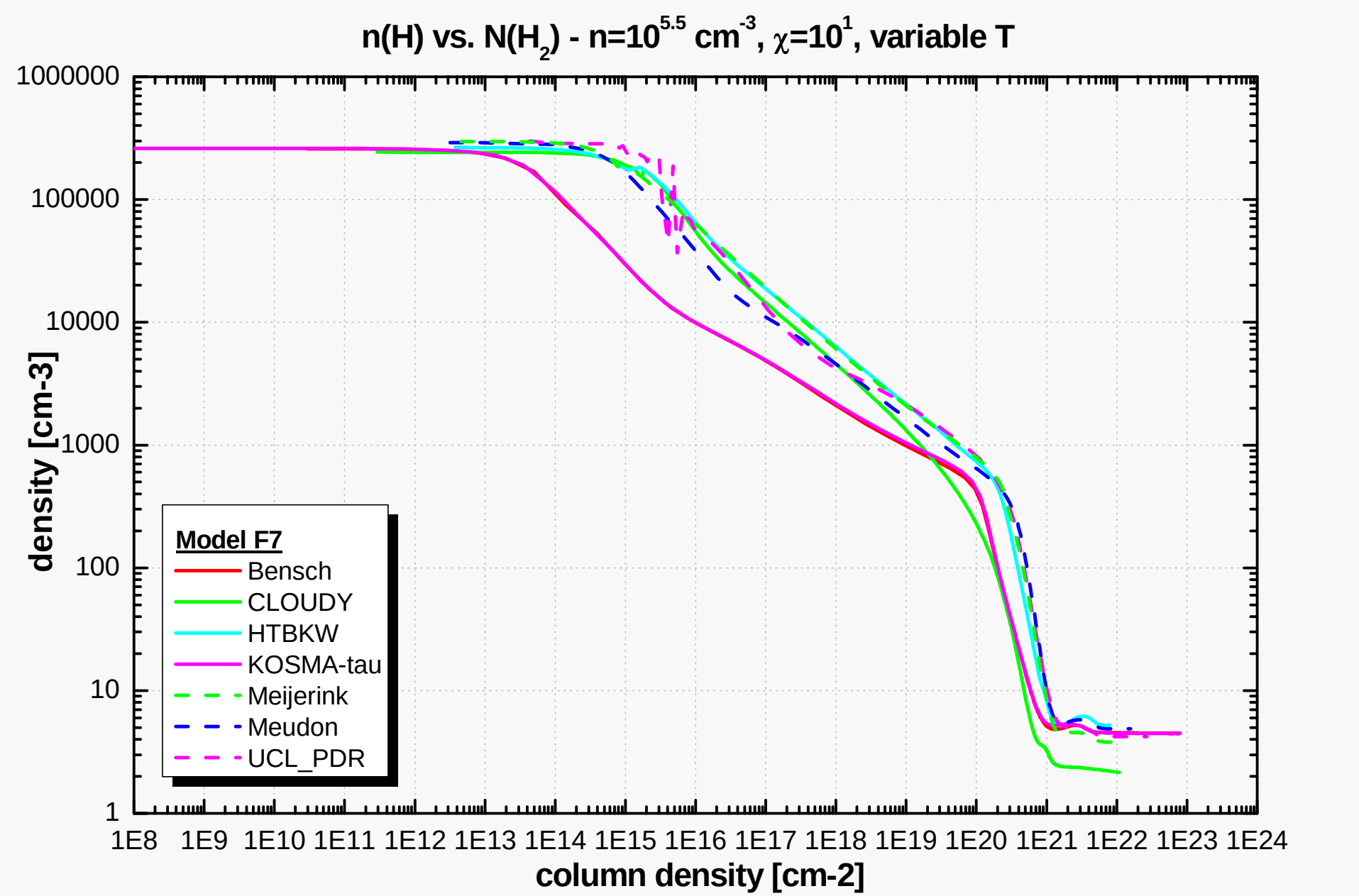

n(H) vs N(H2) - n=10^3 cm^-3, χ=10
density [cm-3]
1000
100
10
1
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
column density [cm-2]
Model F1
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

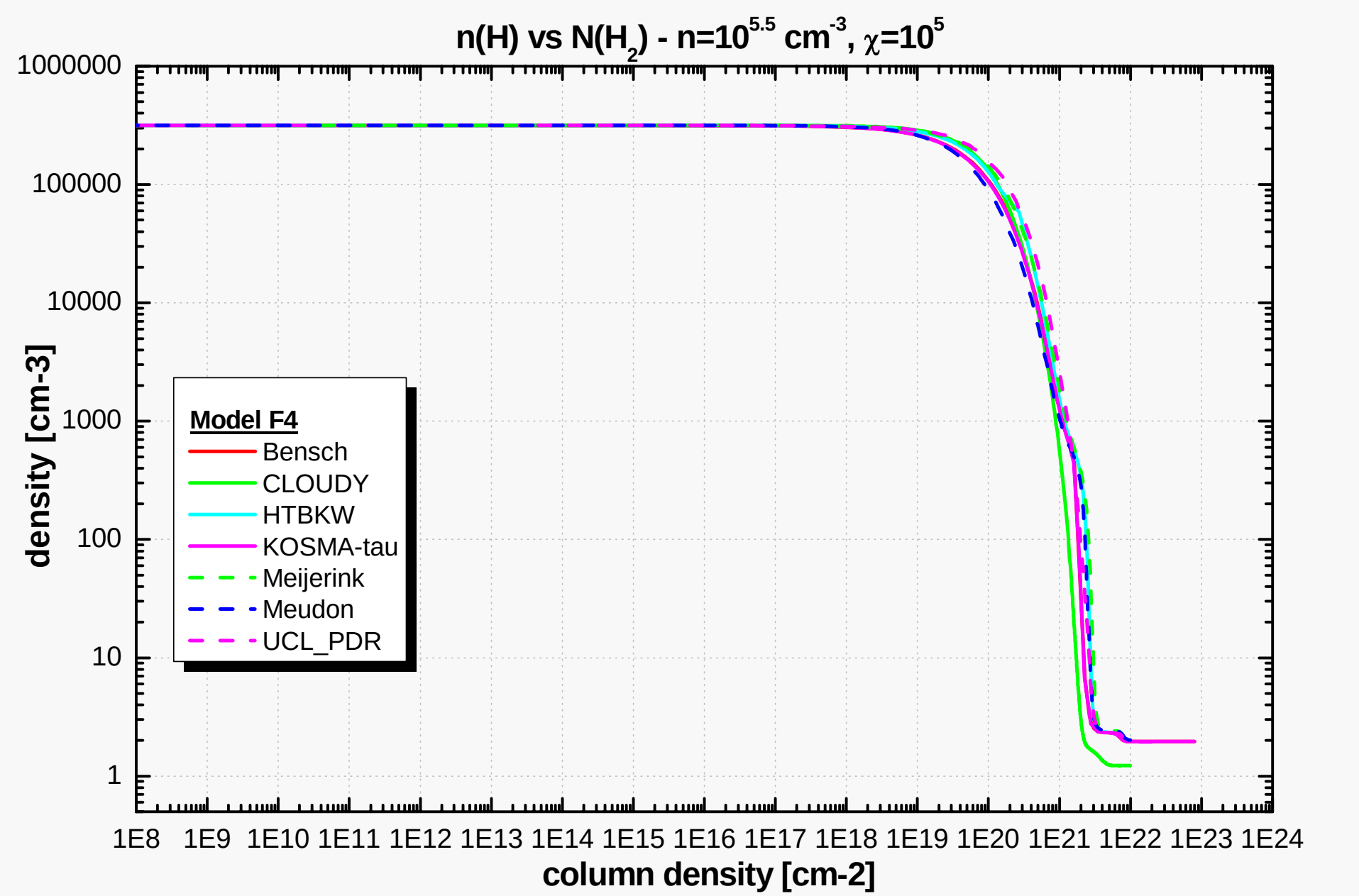

n(H) vs. N(H2) - n=10^3 cm^-3, χ=10^1, variable T
density [cm-3]
1000
100
10
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F5
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

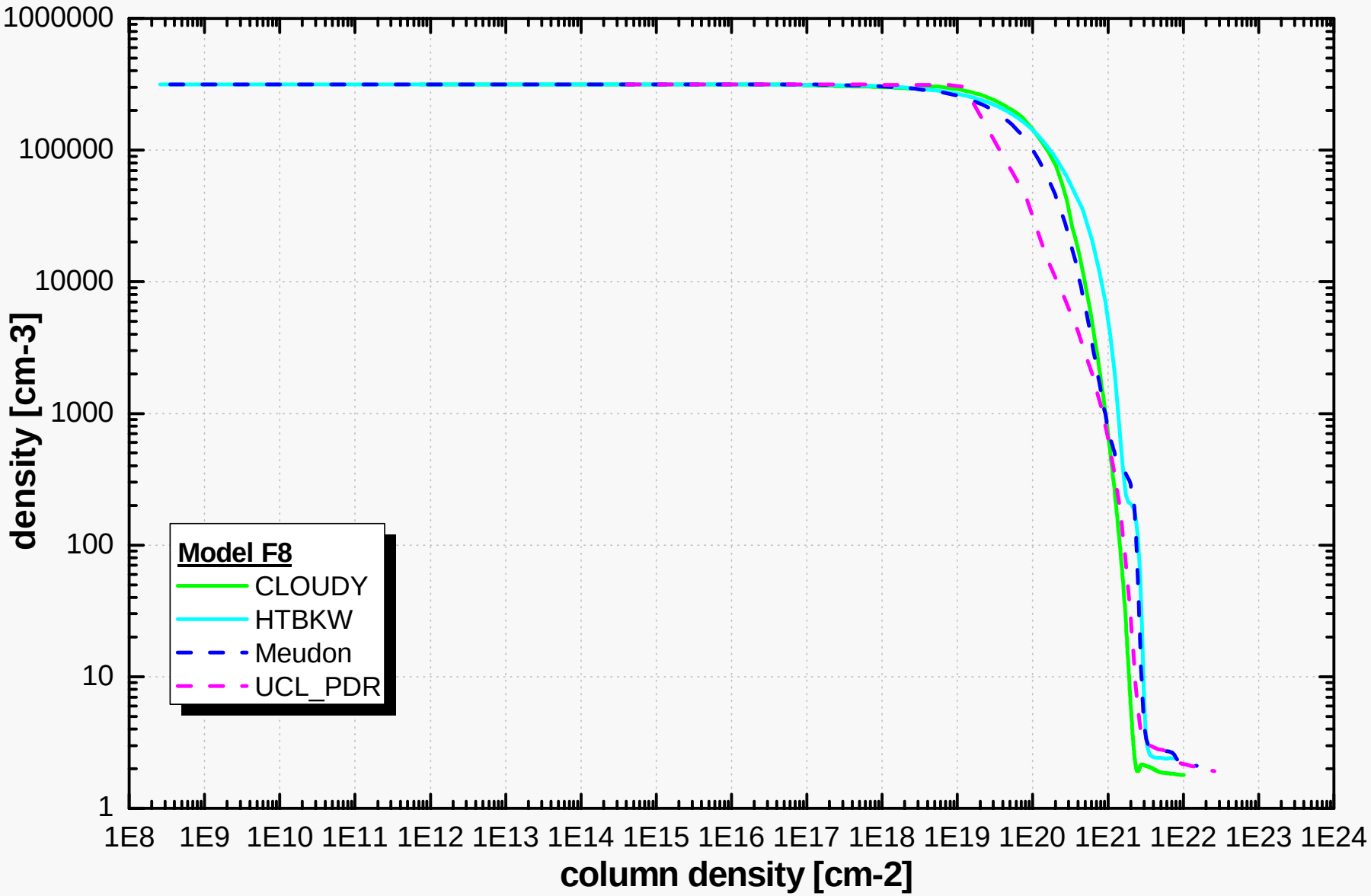

n(H) vs N(H2) - n=10^3 cm^-3, χ=10^5
density [cm-3]
1000
100
10
1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F2
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR


n(H) vs. N(H2) - n=10^3 cm^-3, χ=10^5, variable T
density [cm-3]
1000
100
10
1
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
column density [cm-2]
Model F6
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

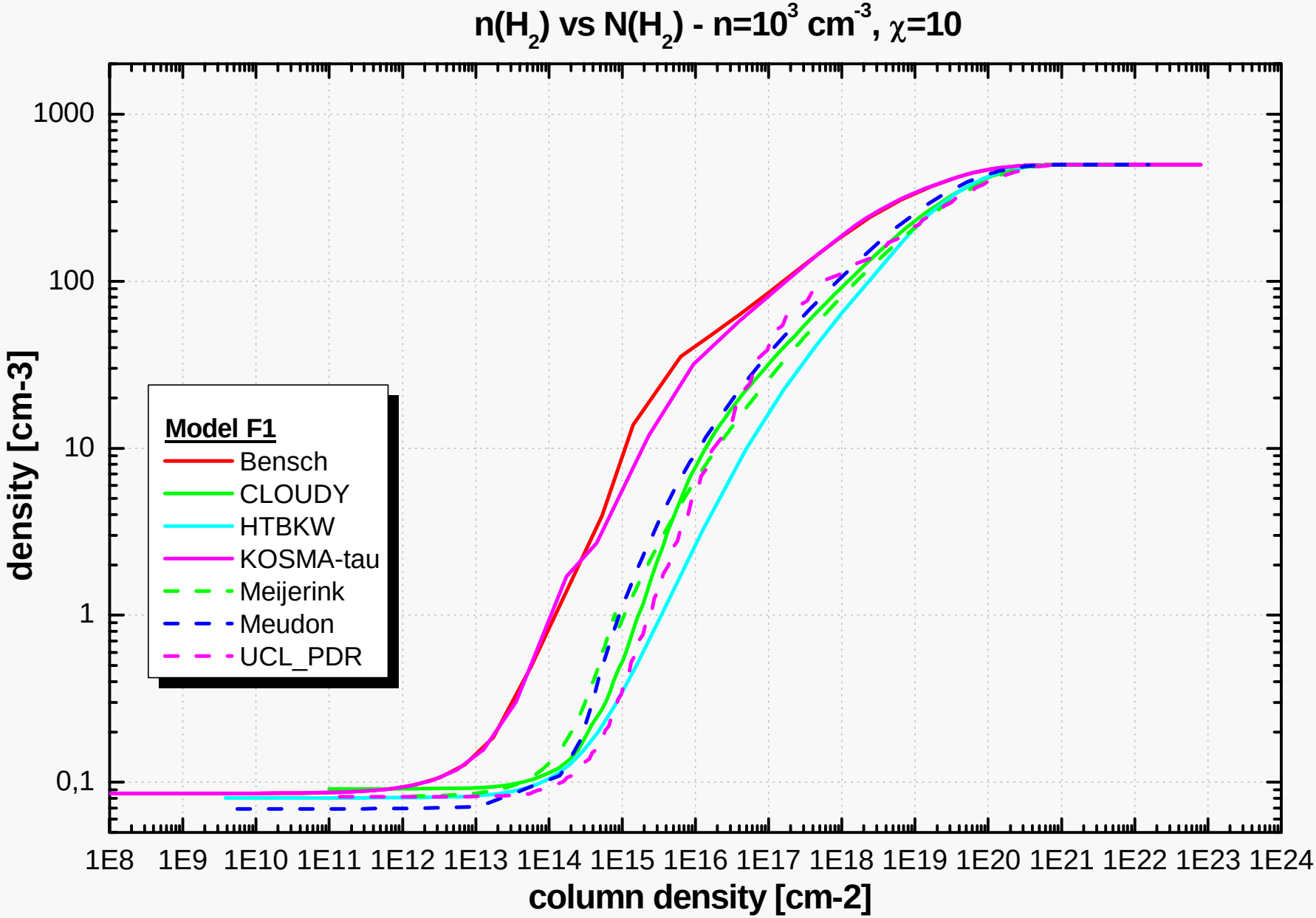

n(H) vs N(H2) - n=10^5.5 cm^-3, χ=10^1
density [cm-3]
1000000
100000
10000
1000
100
10
1
column density [cm-2]
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
Model F3
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

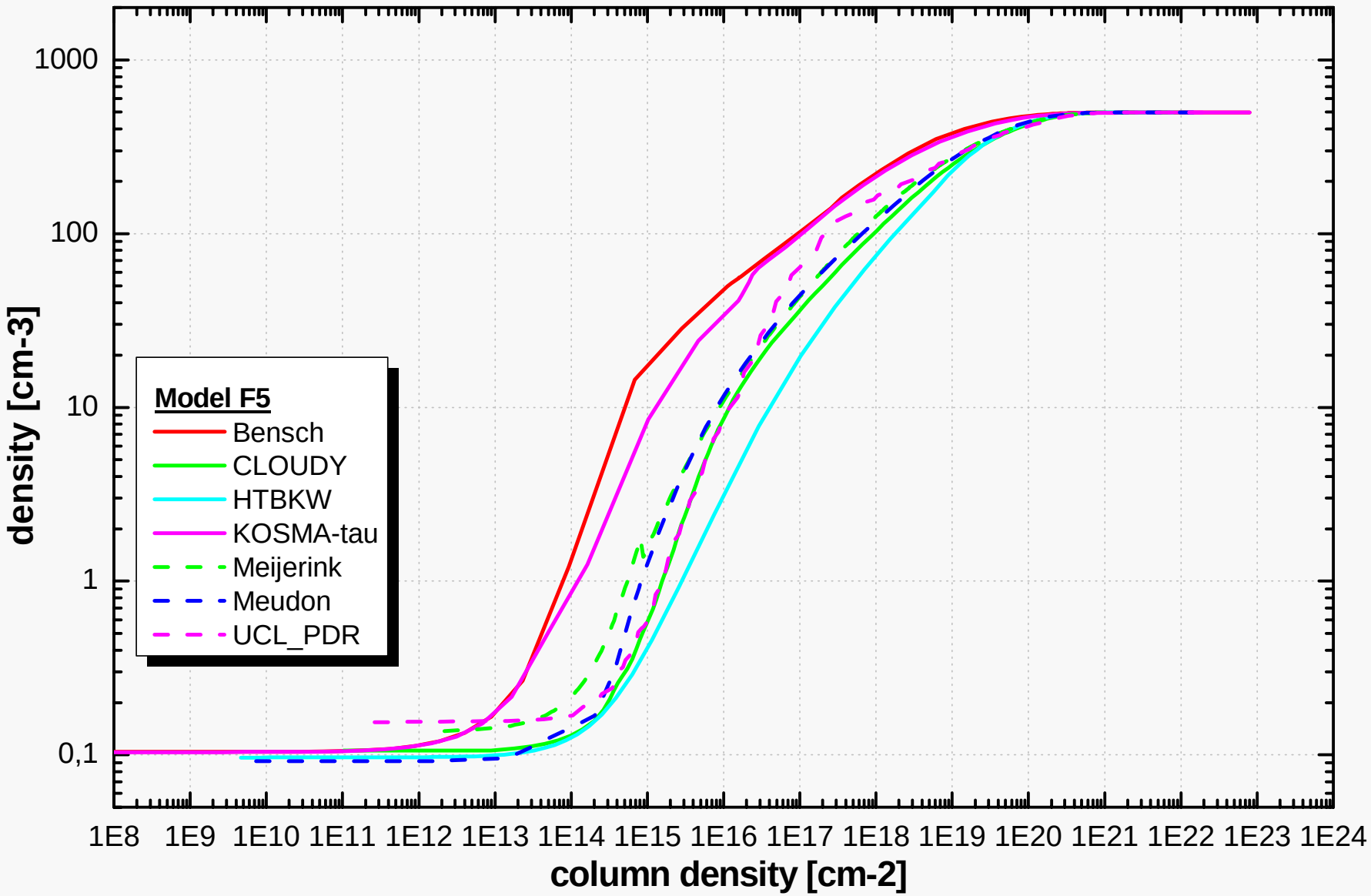

n(H) vs. N(H2) - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm-3]
1000000
100000
10000
1000
100
10
1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F7
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

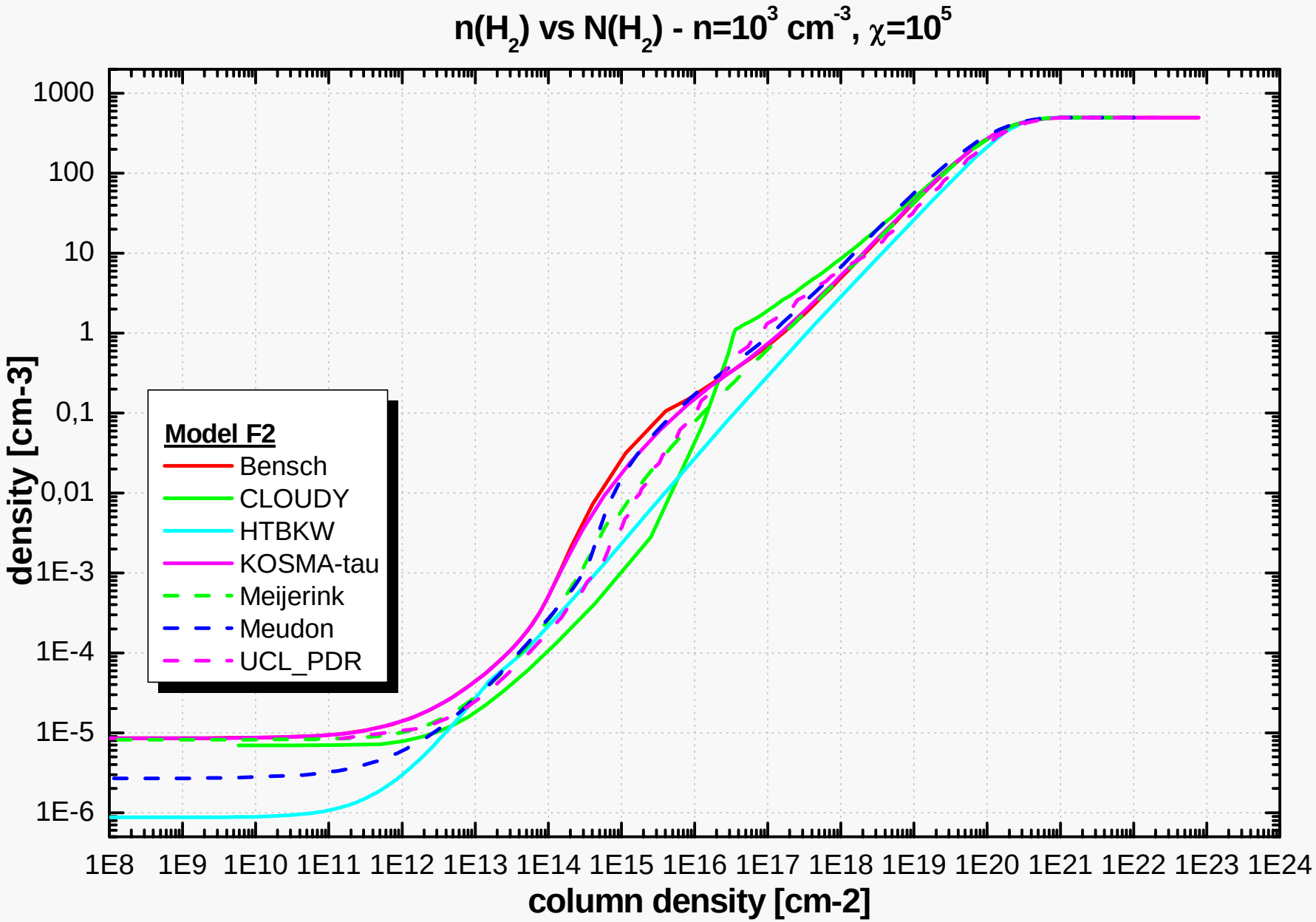

n(H) vs N(H2) - n=10^5.5 cm^-3, χ=10^5
density [cm-3]
1000000
100000
10000
1000
100
10
1
column density [cm-2]
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
Model F4
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

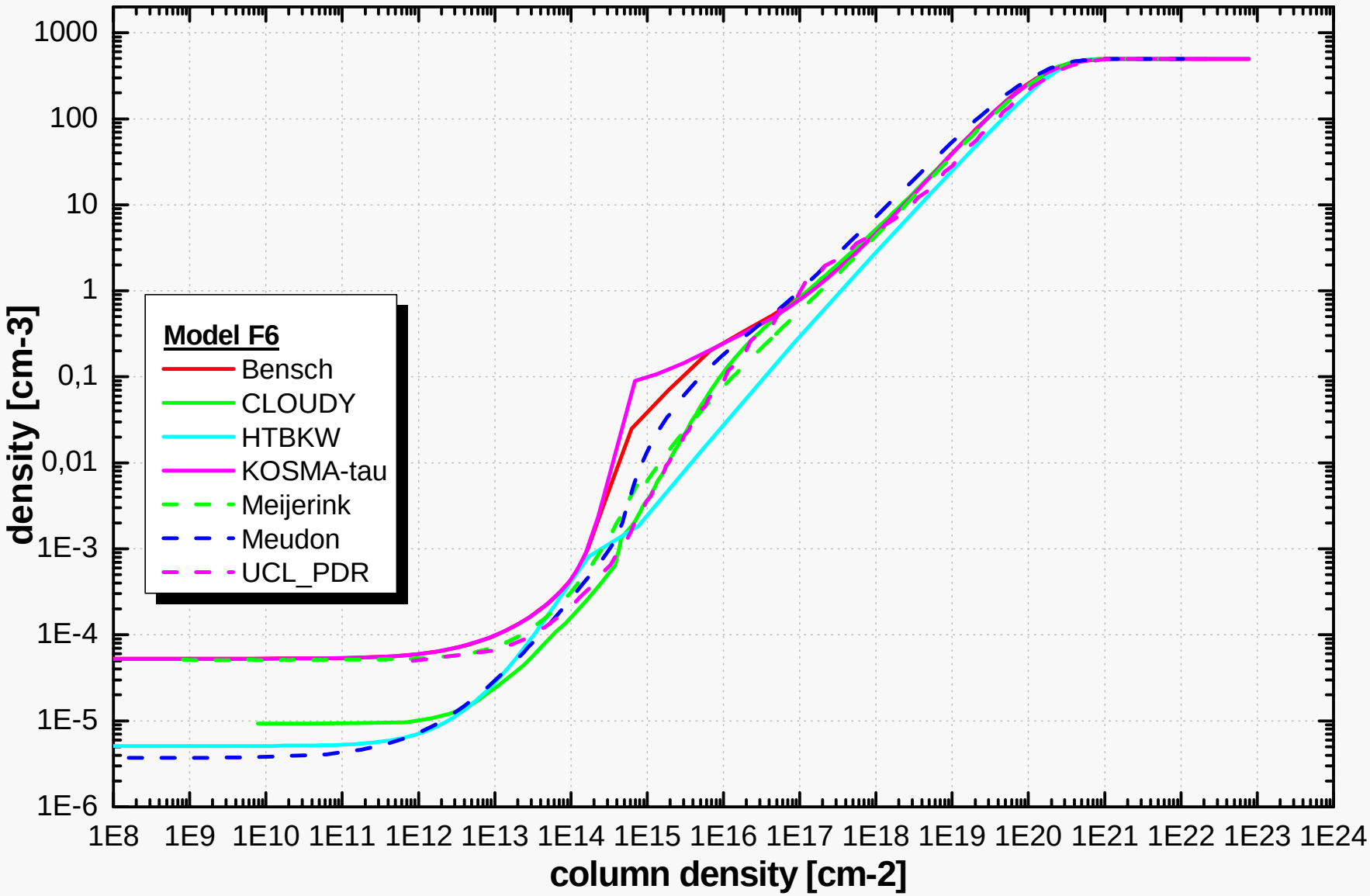

n(H) vs. N(H2) - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm-3]
1000000
100000
10000
1000
100
10
1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F8
CLOUDY
HTBKW
Meudon
UCL_PDR

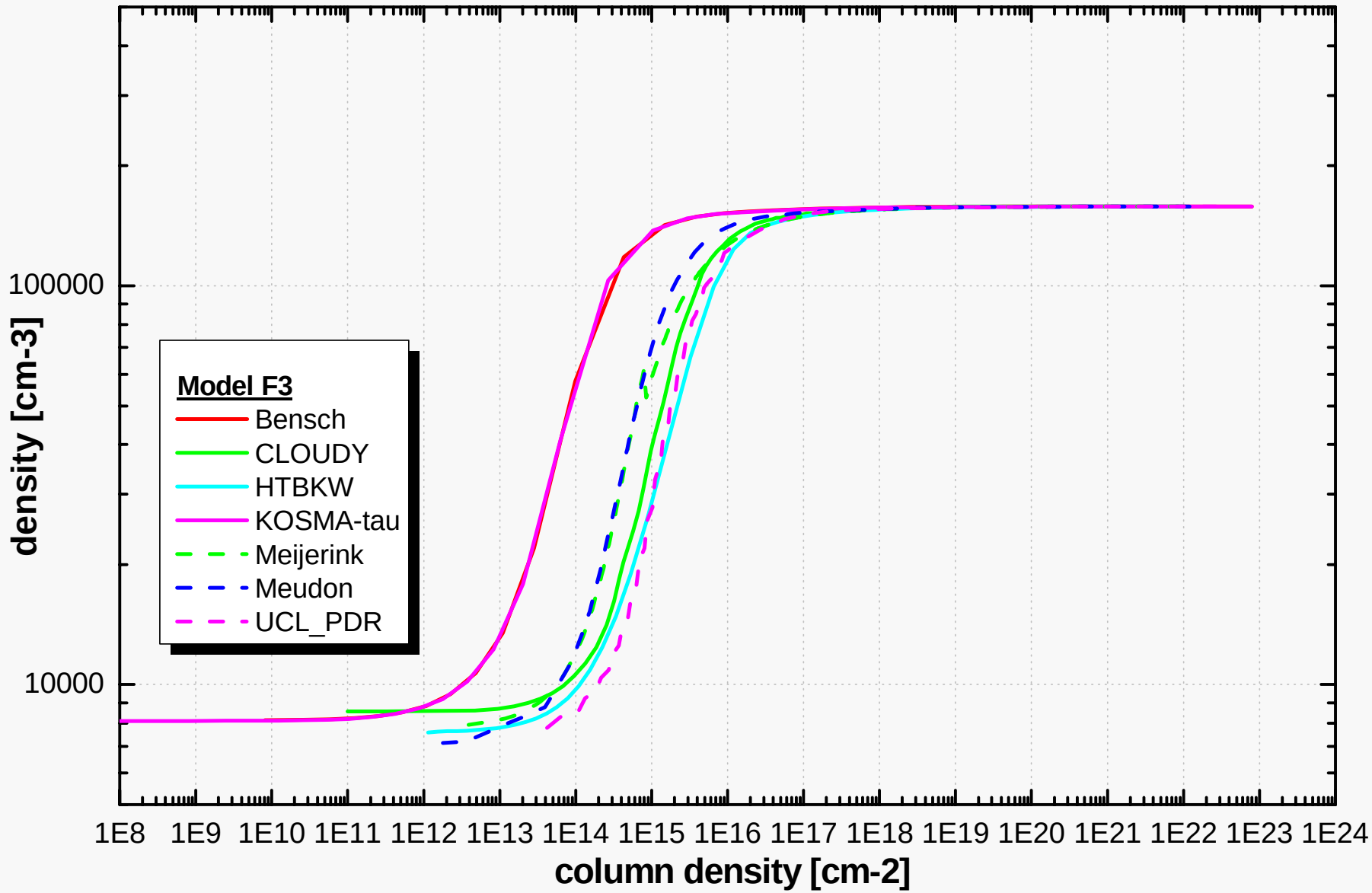
$n(H_2)$ vs. $N(H_2)$

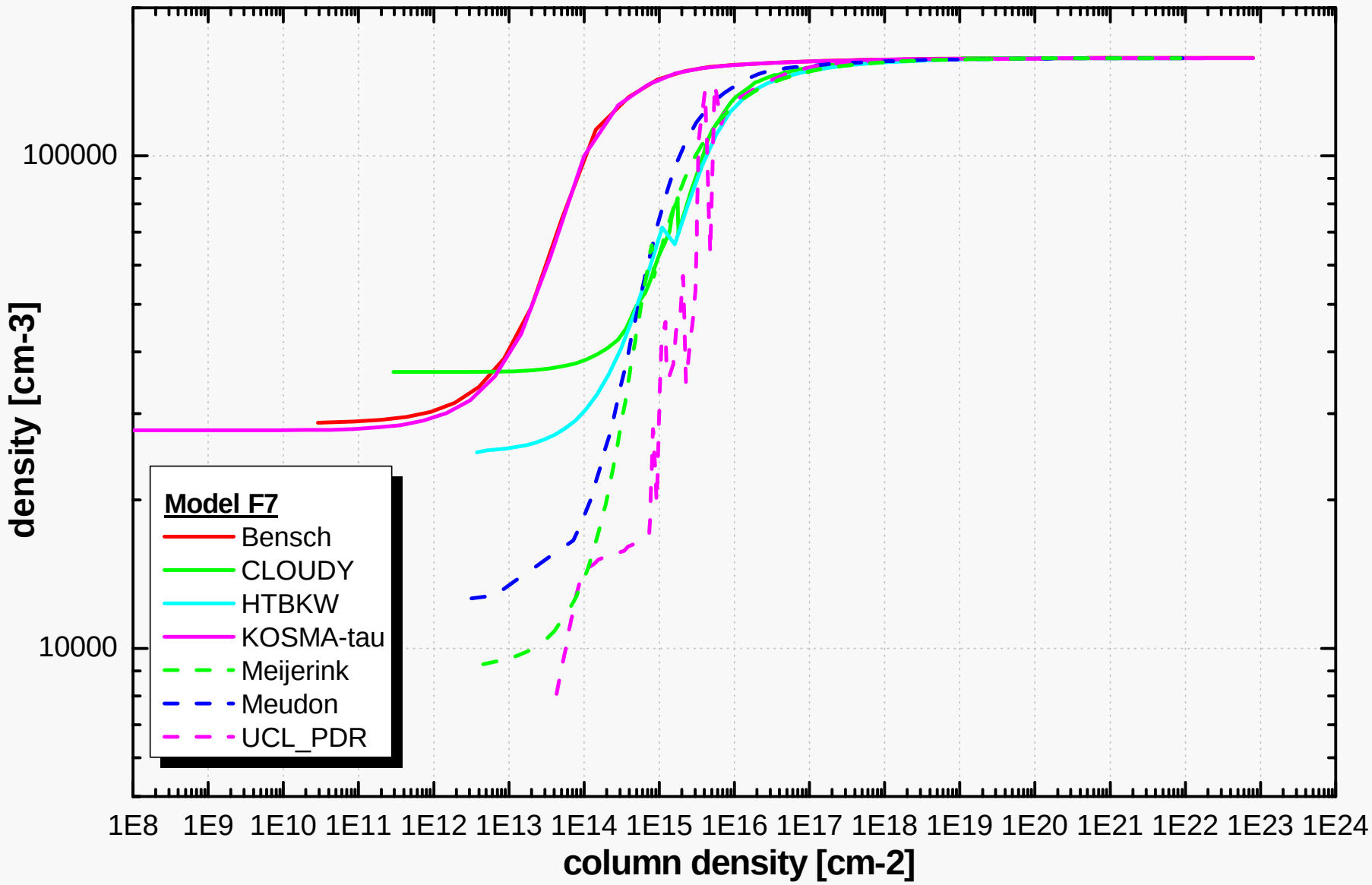

n(H2) vs N(H2) - n=10^3 cm^-3, χ=10
density [cm-3]
1000
100
10
1
0,1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F1
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR

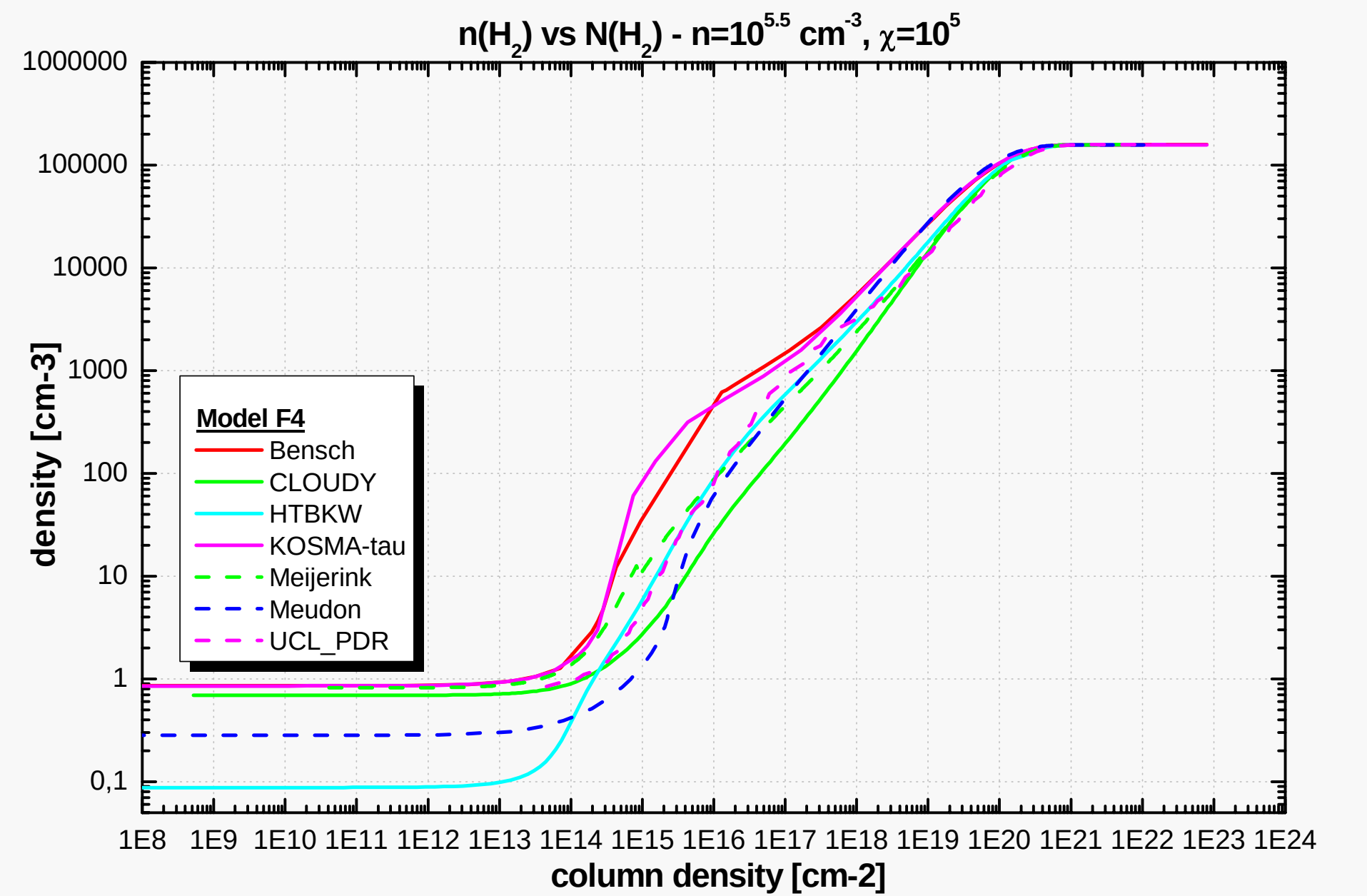

n(H2) vs. N(H2) - n=10^3 cm^-3, χ=10^1, variable T
density [cm-3]
1000
100
10
1
0,1
Model F5
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
column density [cm-2]

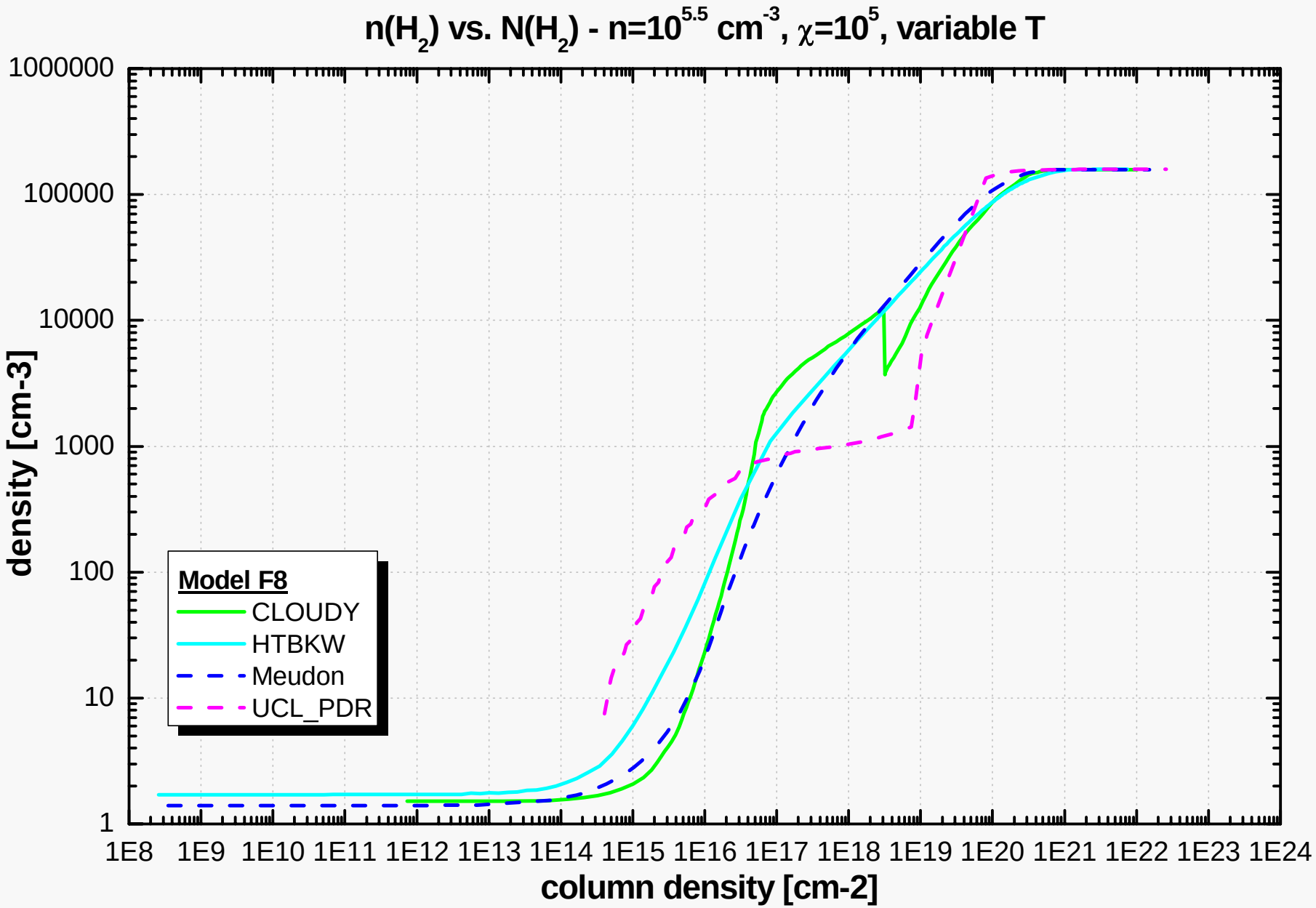

n(H2) vs N(H2) - n=10^3 cm^-3, χ=10^5
density [cm-3]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
Model F2
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
column density [cm-2]


n(H2) vs. N(H2) - n=10^3 cm^-3, χ=10^5, variable T
density [cm-3]
column density [cm-2]
1000
100
10
1
0,1
0,01
1E-3
1E-4
1E-5
1E-6
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
Model F6
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR


n(H2) vs N(H2) - n=10^5.5 cm^-3, χ=10^1
density [cm-3]
100000
10000
Model F3
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
column density [cm-2]


n(H2) vs. N(H2) - n=10^5.5 cm^-3, χ=10^1, variable T
density [cm-3]
100000
10000
column density [cm-2]
1E8 1E9 1E10 1E11 1E12 1E13 1E14 1E15 1E16 1E17 1E18 1E19 1E20 1E21 1E22 1E23 1E24
Model F7
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR


n(H2) vs N(H2) - n=10^5.5 cm^-3, χ=10^5
density [cm-3]
column density [cm-2]
1000000
100000
10000
1000
100
10
1
0,1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
Model F4
Bensch
CLOUDY
HTBKW
KOSMA-tau
Meijerink
Meudon
UCL_PDR


n(H2) vs. N(H2) - n=10^5.5 cm^-3, χ=10^5, variable T
density [cm-3]
1000000
100000
10000
1000
100
10
1
1E8
1E9
1E10
1E11
1E12
1E13
1E14
1E15
1E16
1E17
1E18
1E19
1E20
1E21
1E22
1E23
1E24
column density [cm-2]
Model F8
CLOUDY
HTBKW
Meudon
UCL_PDR