

The cloudy climate of HATS-6b

Sven Kiefer

N. Bach-Møller, D. Samra, D. A. Lewis, A. D. Schneider, F. Amido,
H. Lecoq Molinos, L. Decin, L. Carone, U. Jørgensen, Ch. Helling

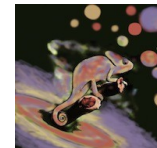
KU LEUVEN

ÖAW

ÖSTERREICHISCHE
AKADEMIE DER
WISSENSCHAFTEN

IWF
INSTITUT FÜR
WELTRAUMFORSCHUNG

TU
Graz

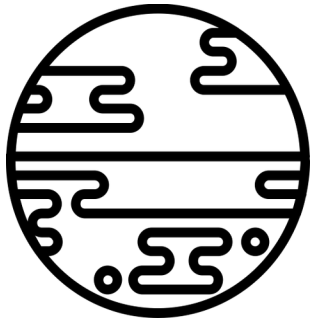


MARIE CURIE ACTIONS

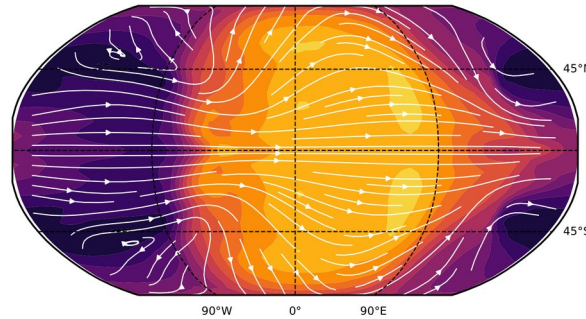


Overview

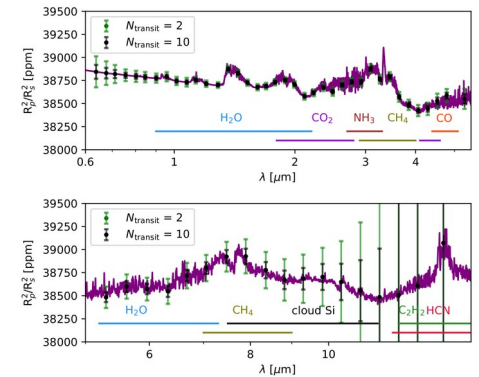
Why HATS-6b?



The cloudy-climate of
a warm Saturn





Observations





Why HATS-6b?


HATS-6 b


Star: 


 0.57 M_{\odot}


 0.57 R_{\odot}


 3724 K


 M-dwarf

Planet: 

 0.319 M_J


 0.998 R_J


 700 K


 Warm Saturn


Why HATS-6b?


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
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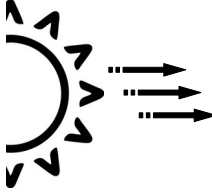
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
 M-dwarfs are active


- Stellar irradiation
- Stellar energetic Particles (SEPs)





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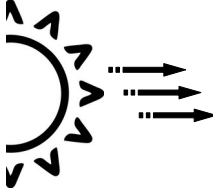
HATS-6 b

Star: 

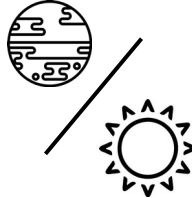
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-  0.57 R_{\odot}
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
 **M-dwarfs are small**


- Large transit depths (3.2%)
- Questions about formation





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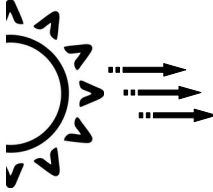
HATS-6 b

Star: 

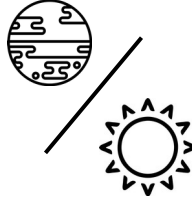
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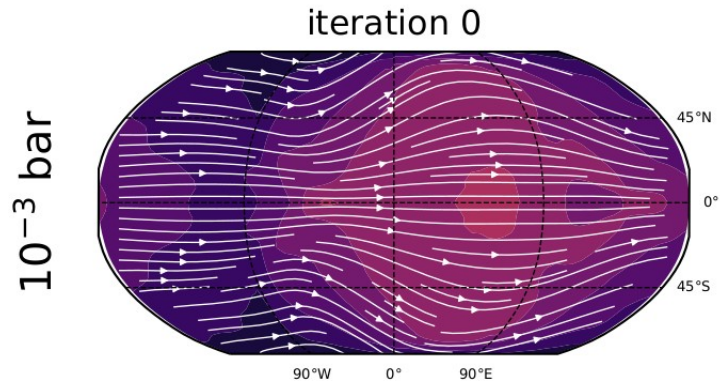
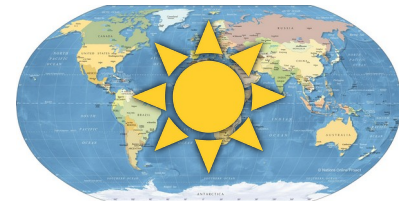
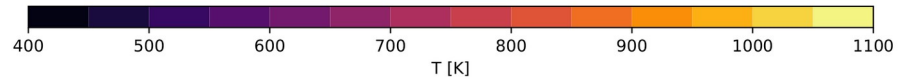
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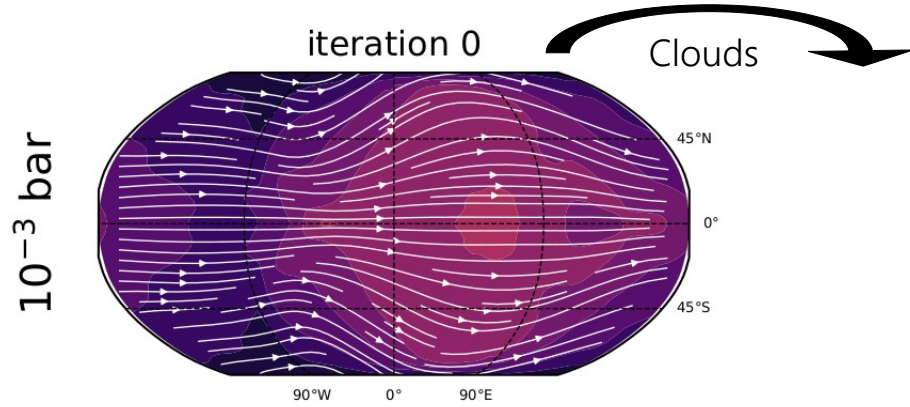
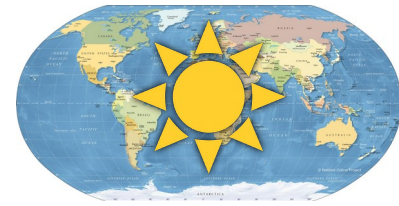
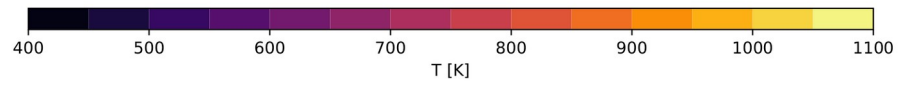
 **HATS-6b is temperate**

- Effective Temperature ~ 700 K
- Global cloud coverage

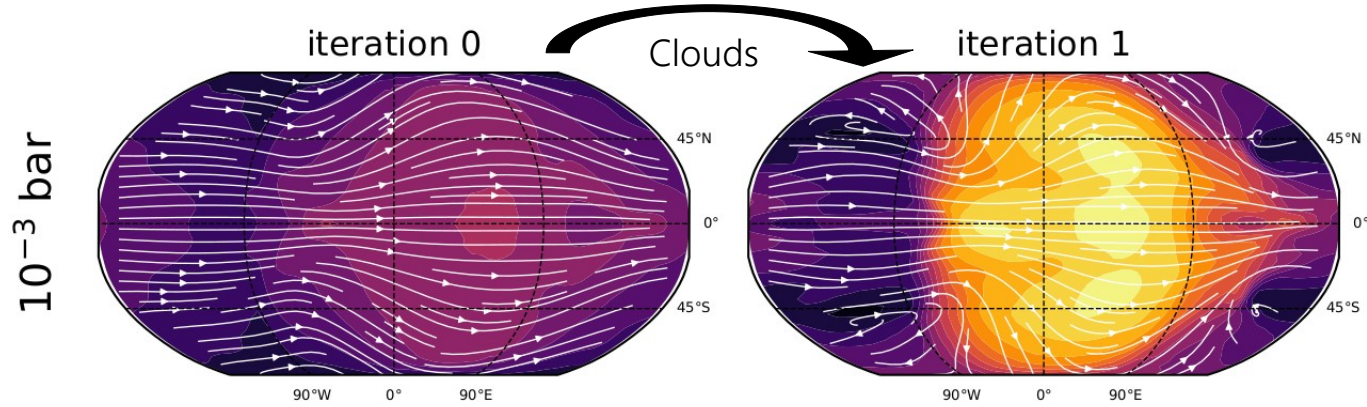
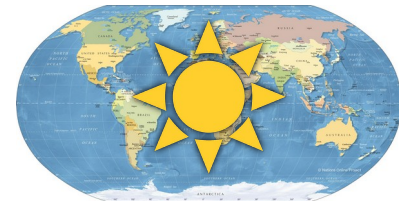
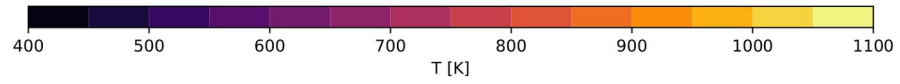
Clouds in 3D



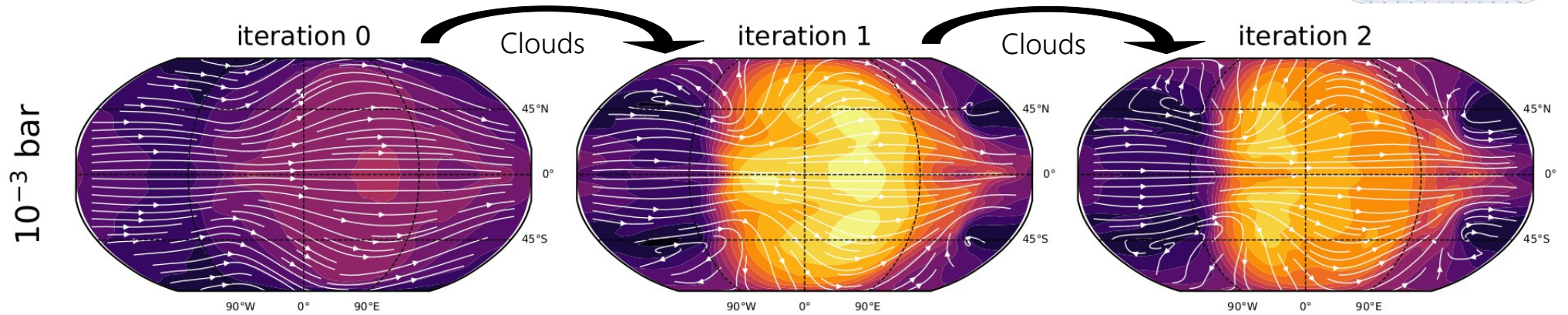
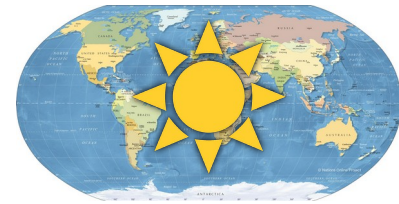
Clouds in 3D



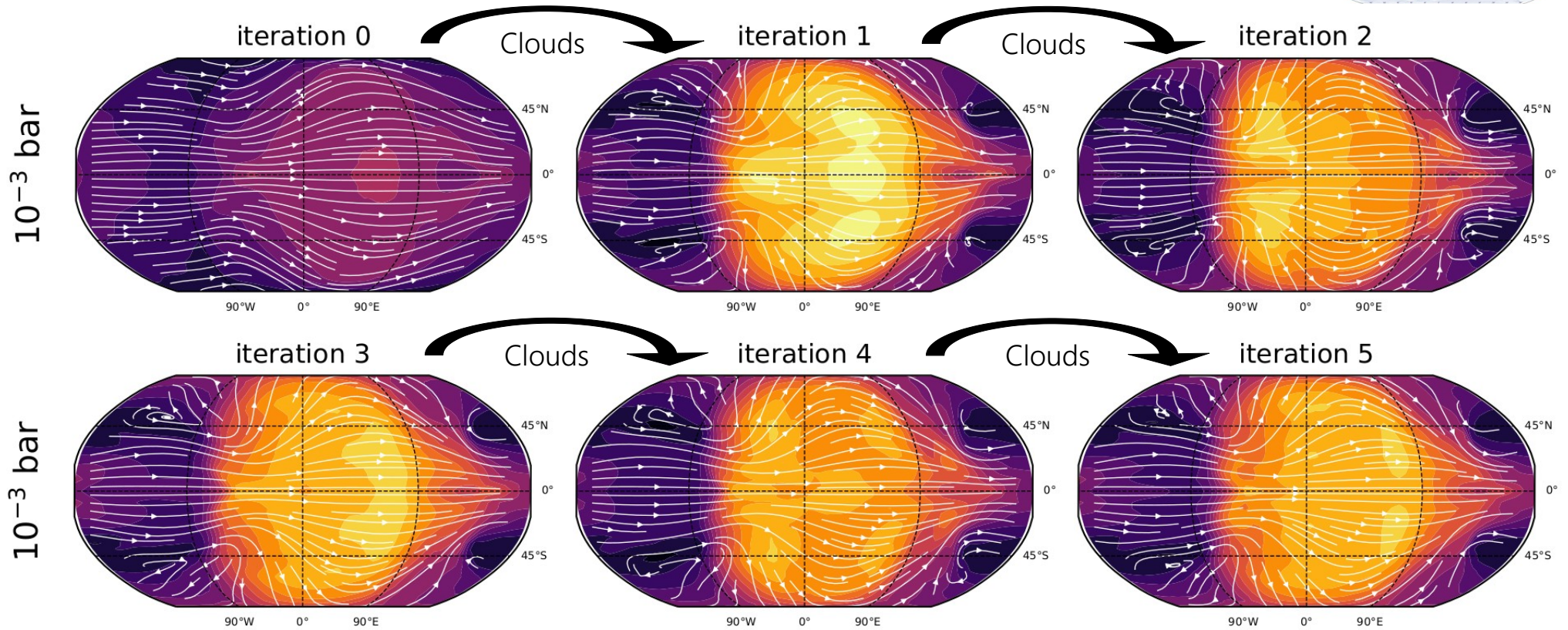
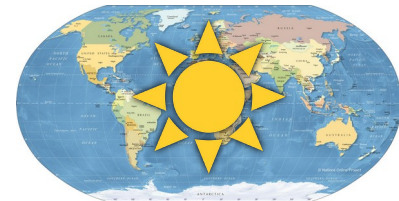
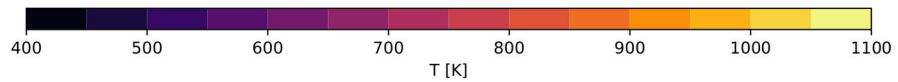
Clouds in 3D



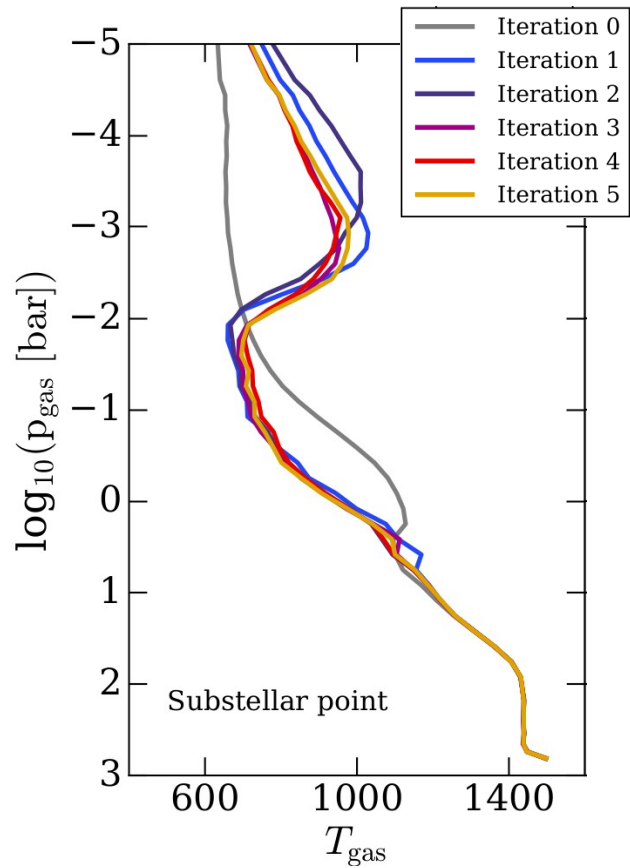
Clouds in 3D



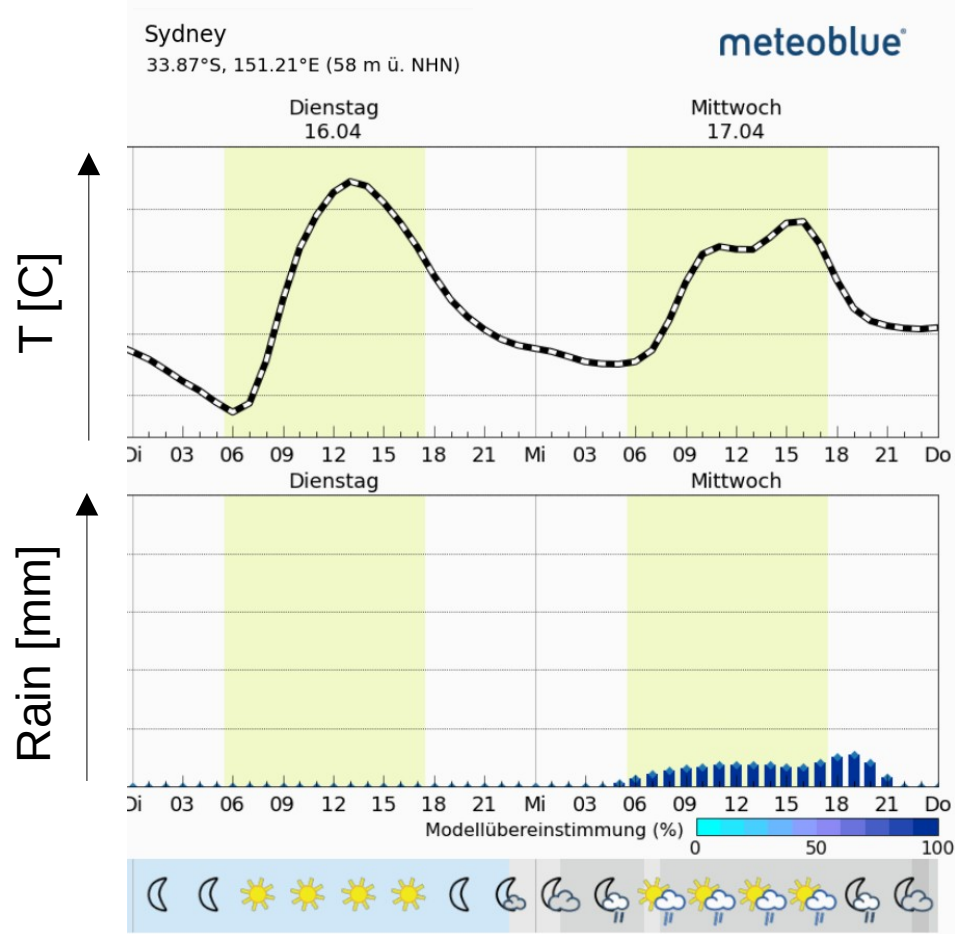
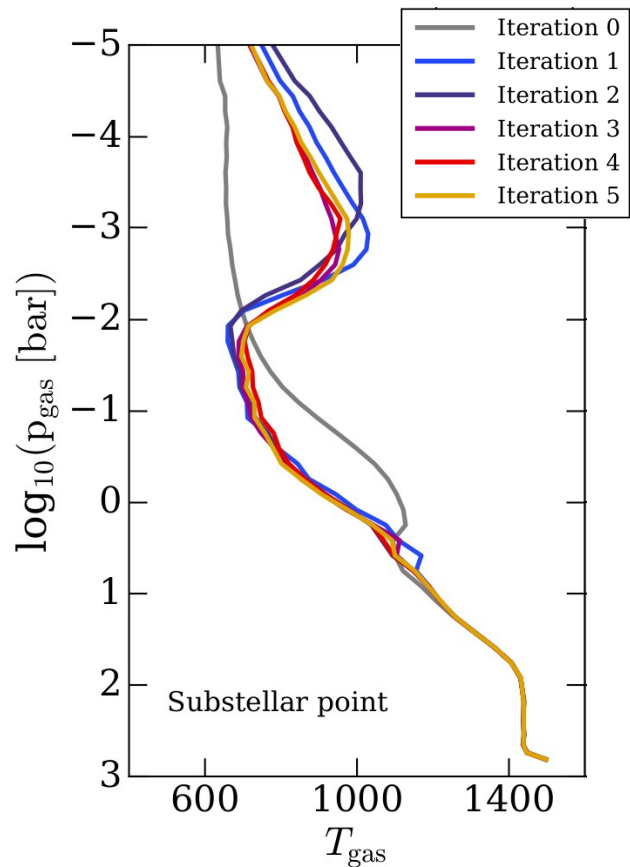
Clouds in 3D



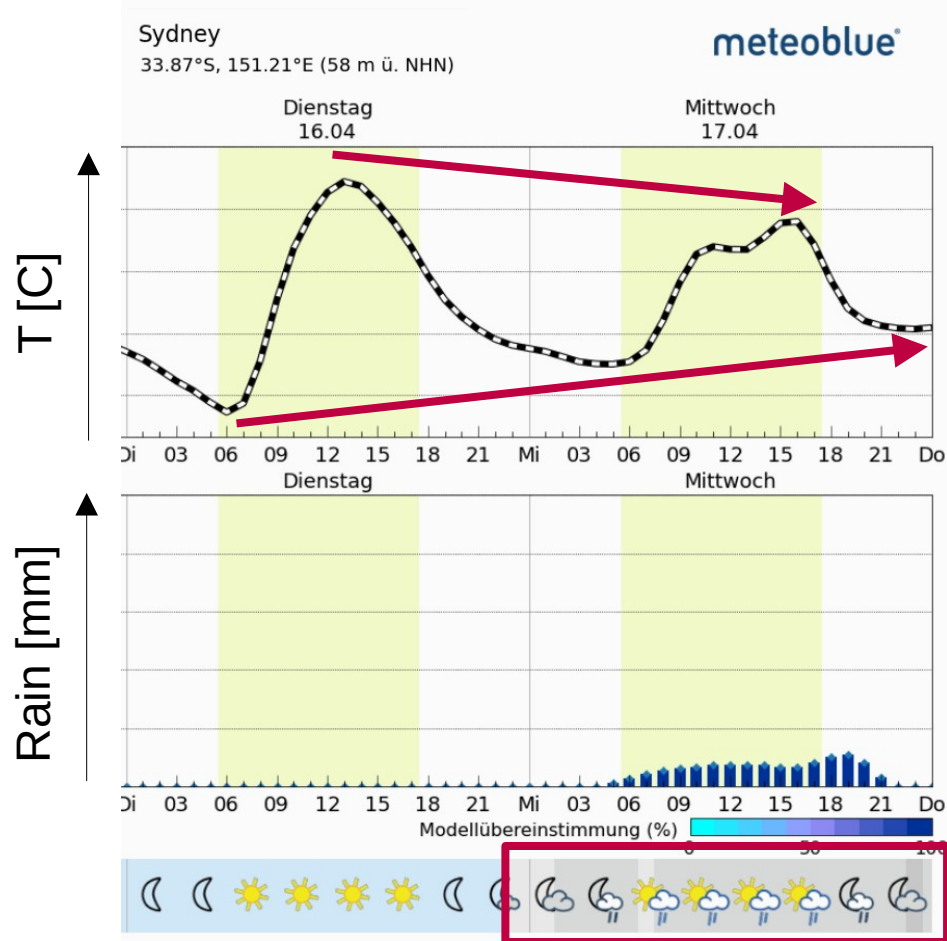
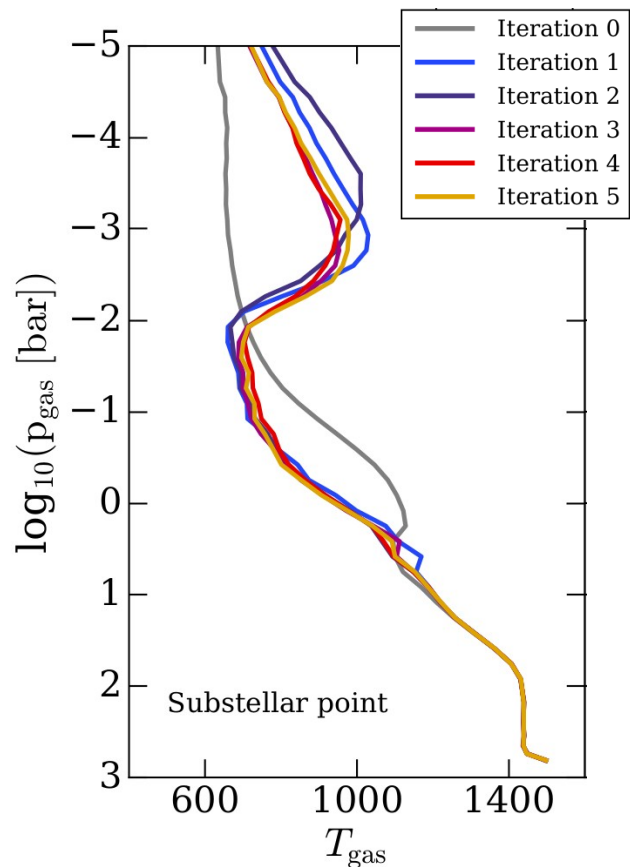
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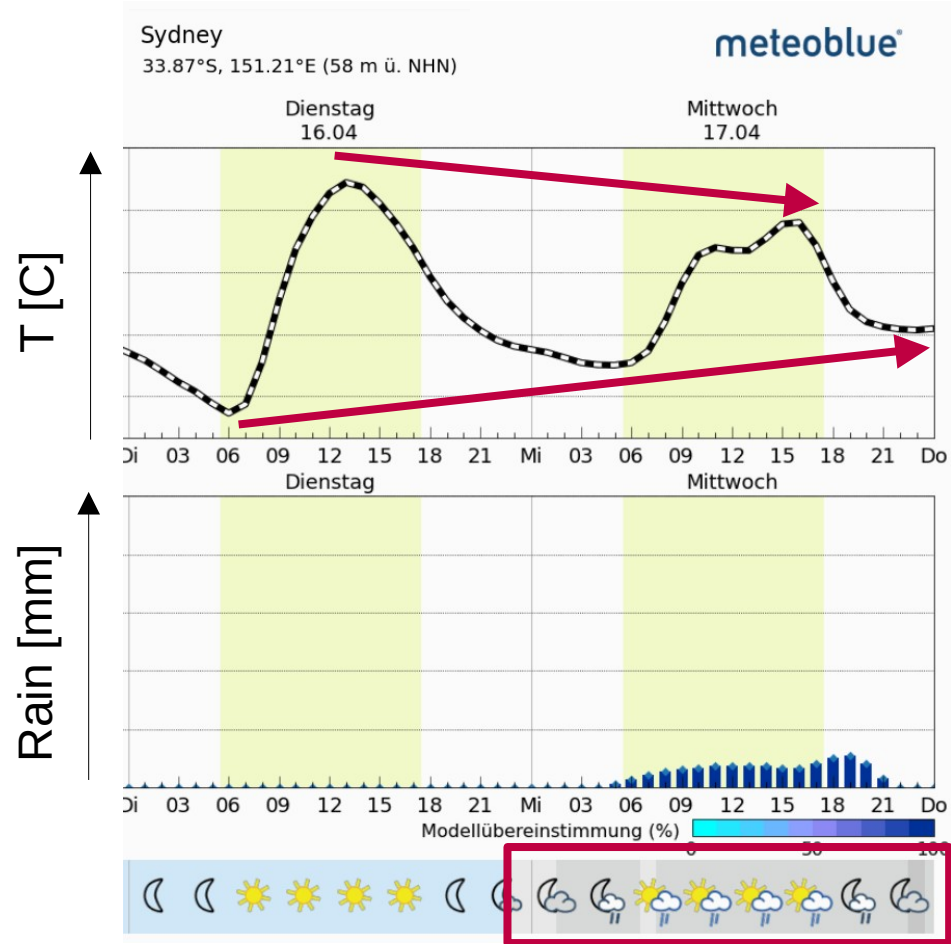
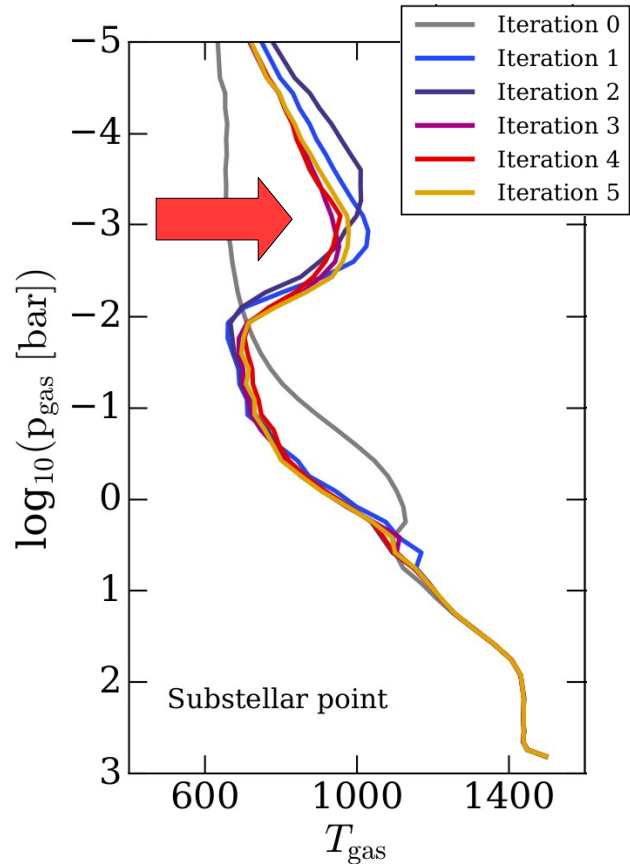
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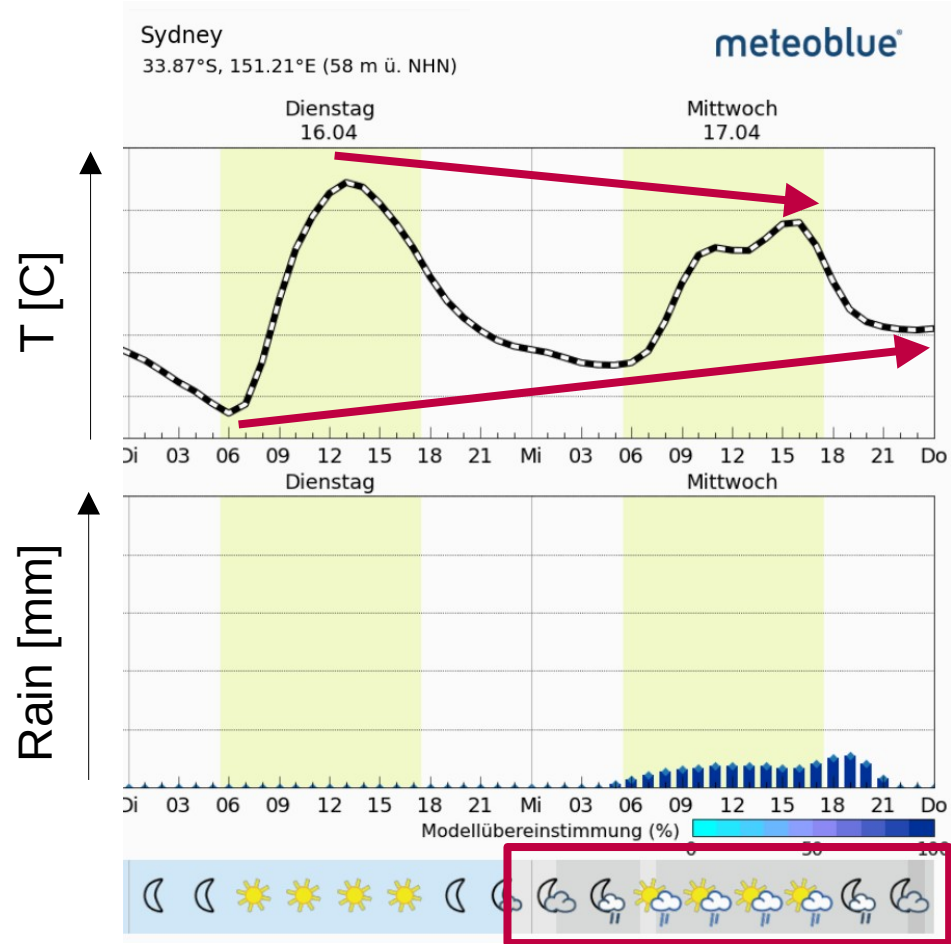
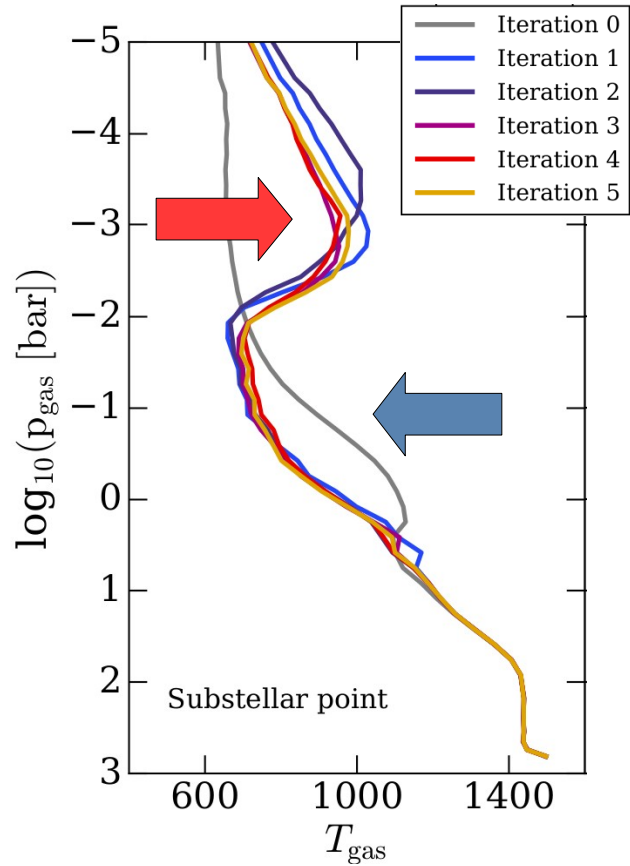
Clouds in 3D



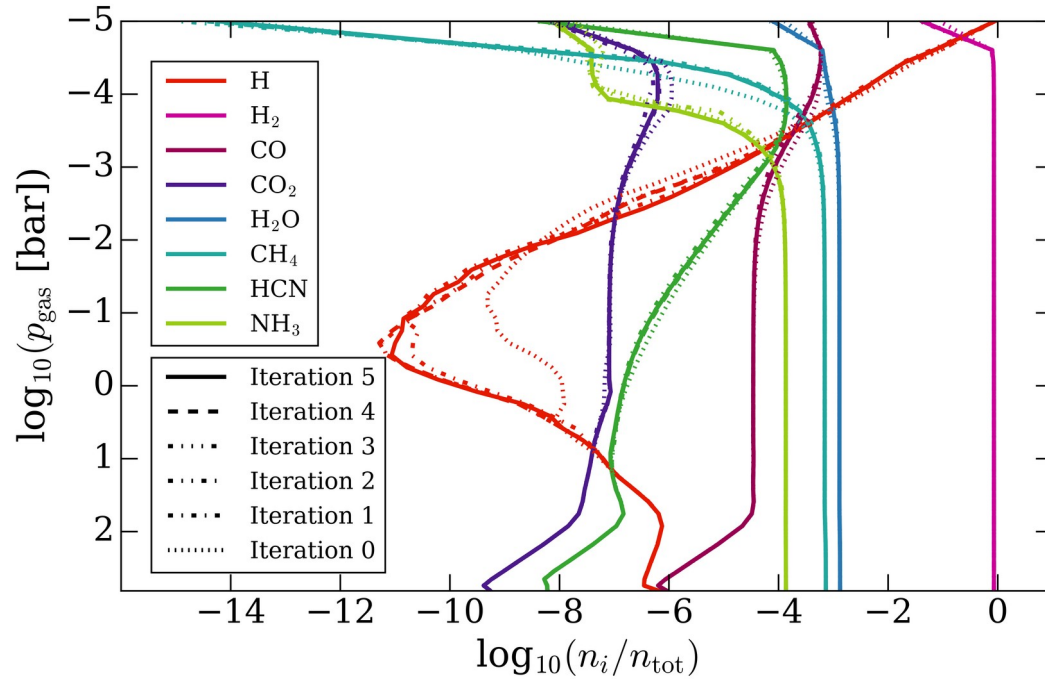
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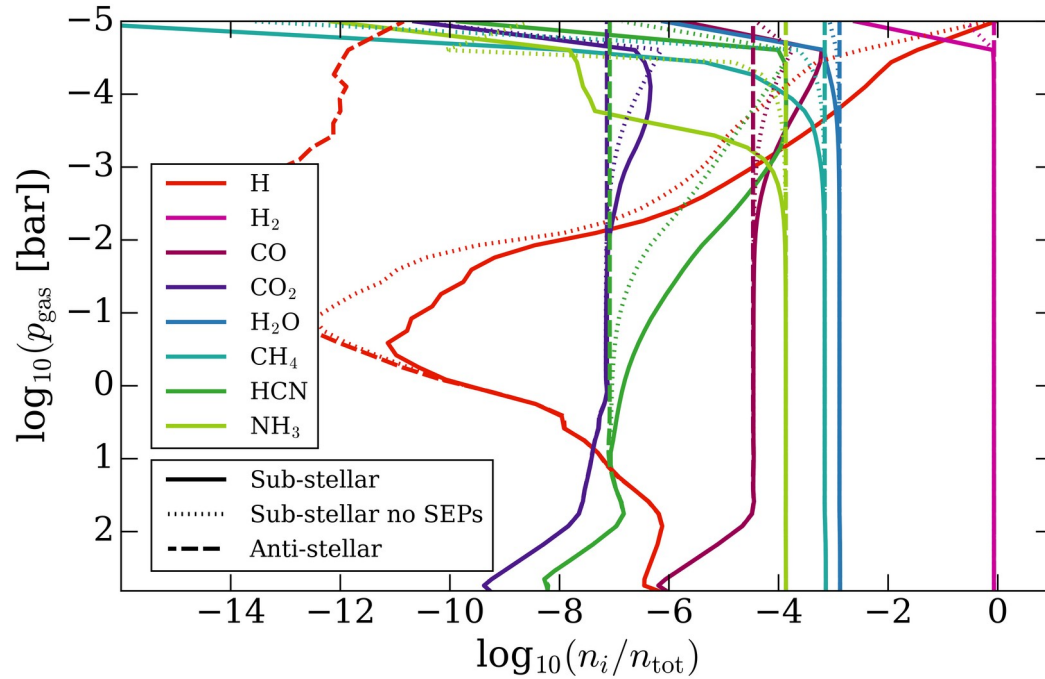
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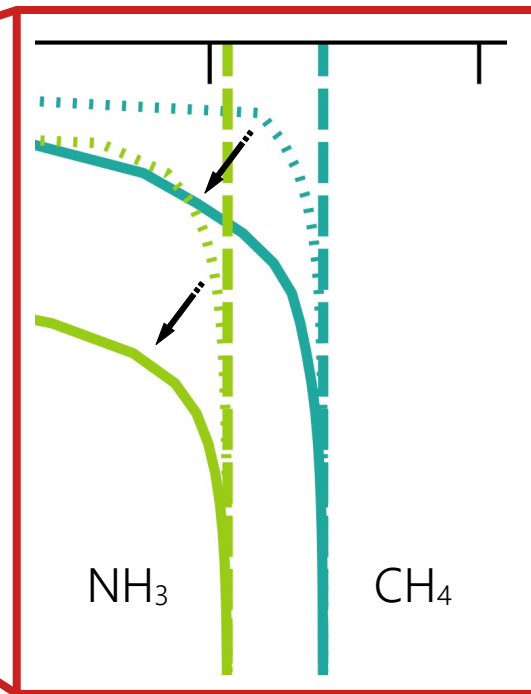
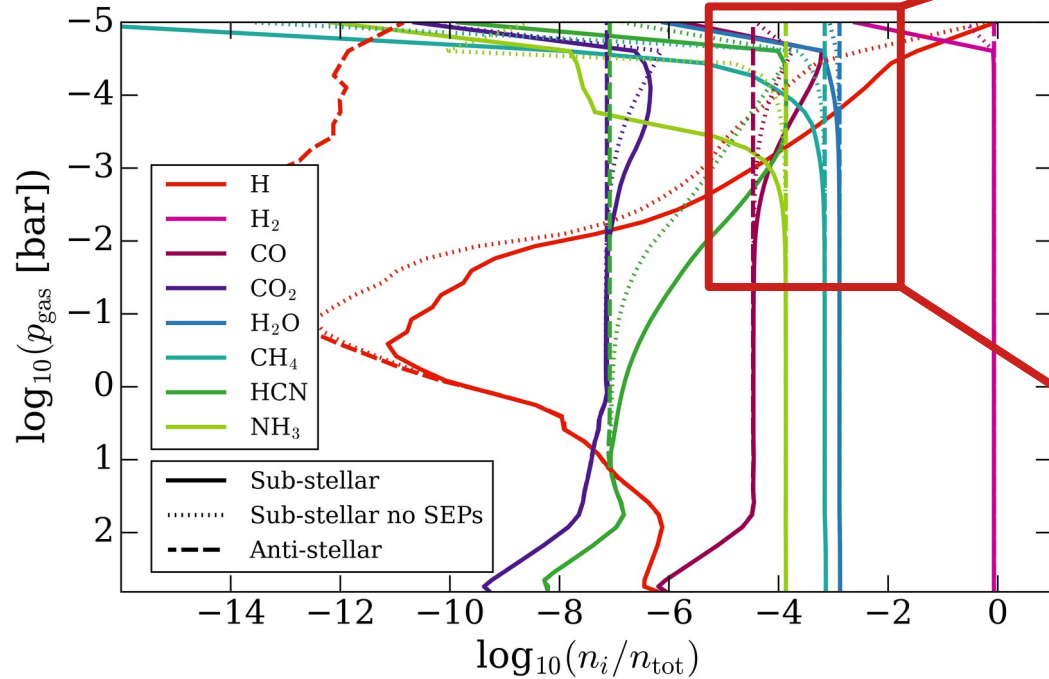
Chemistry



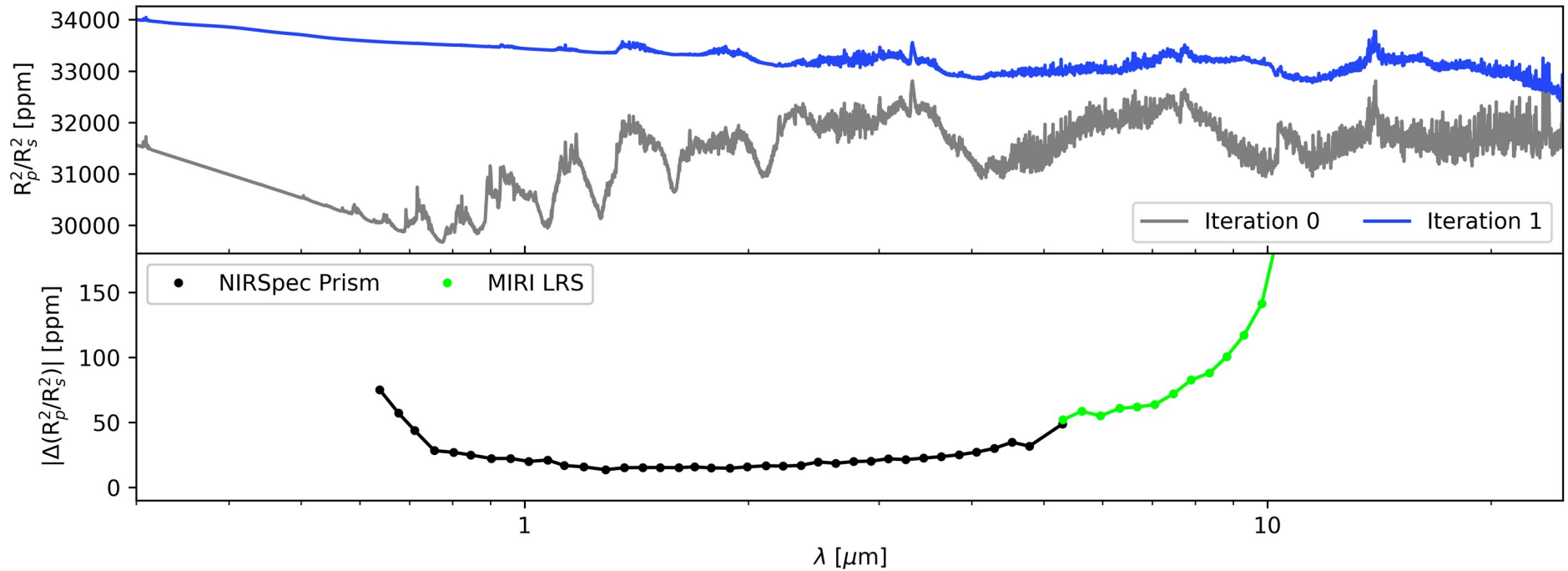
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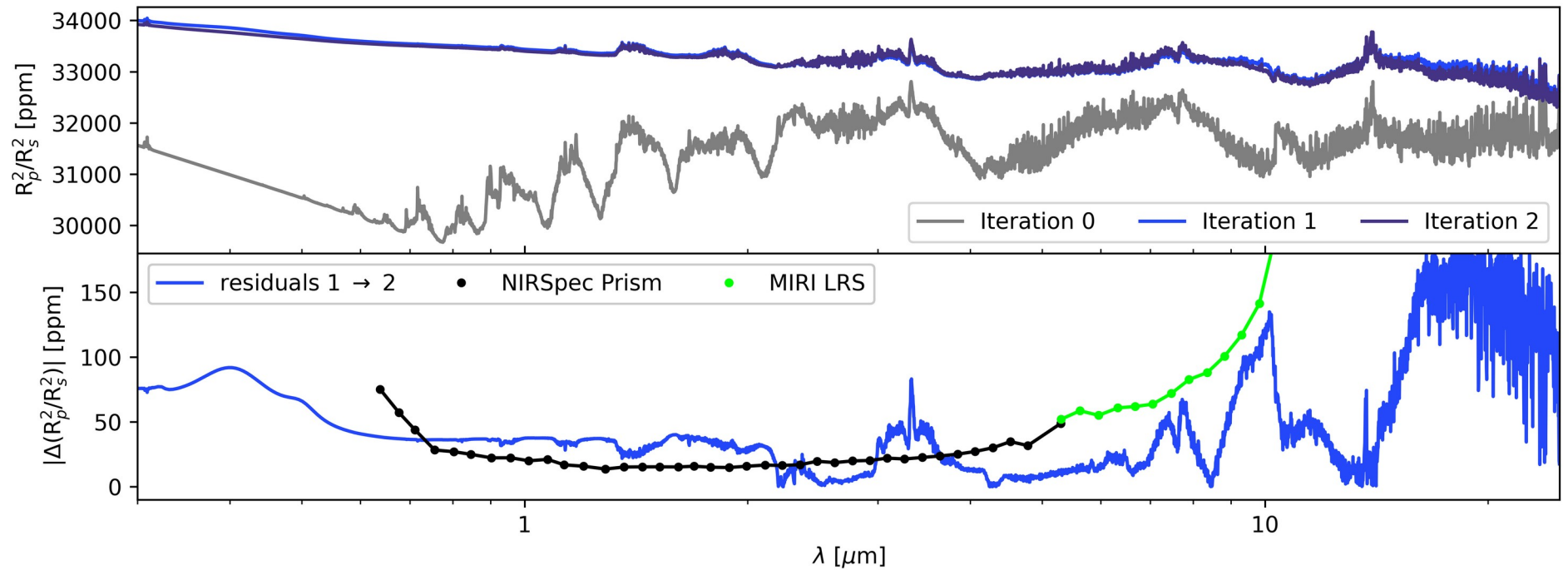
Chemistry



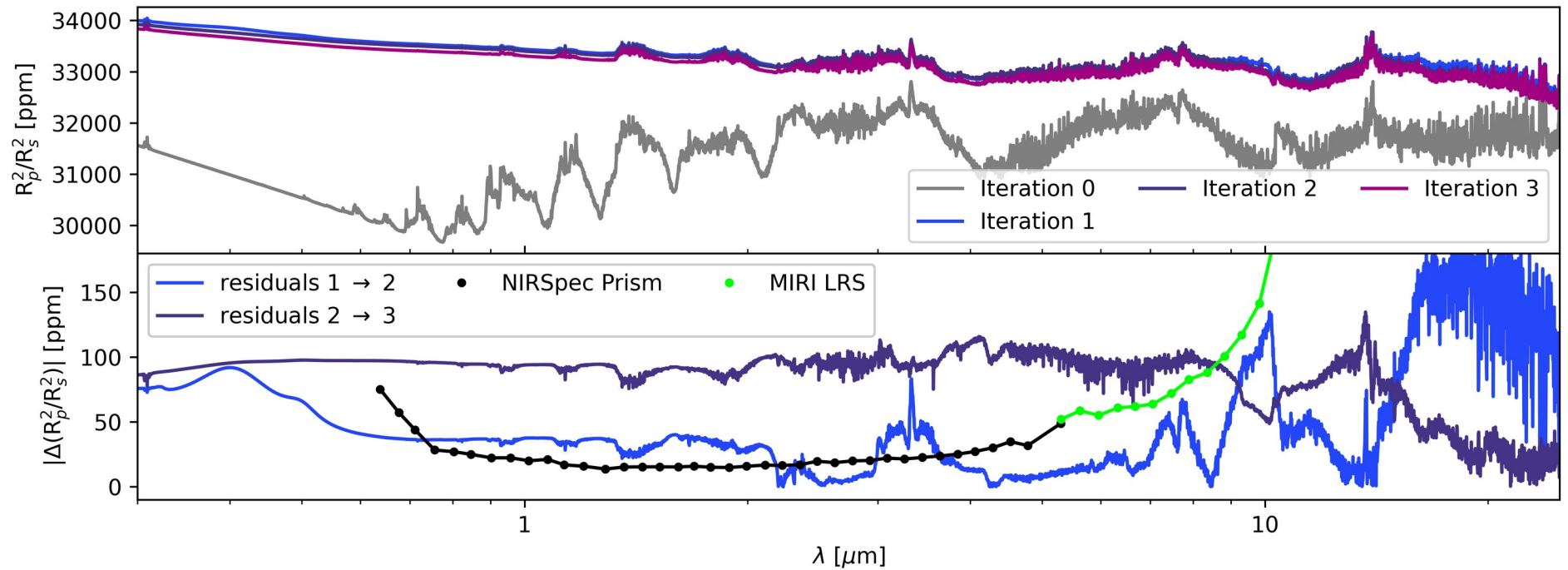
Is it observable?



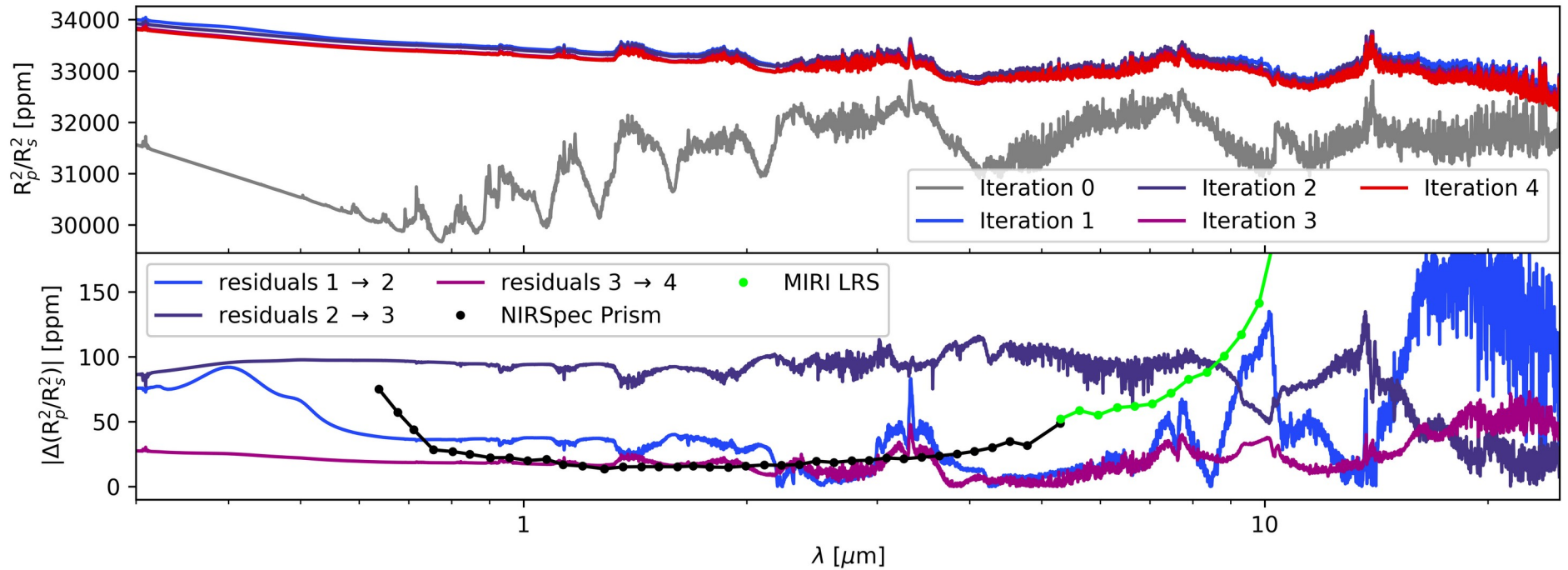
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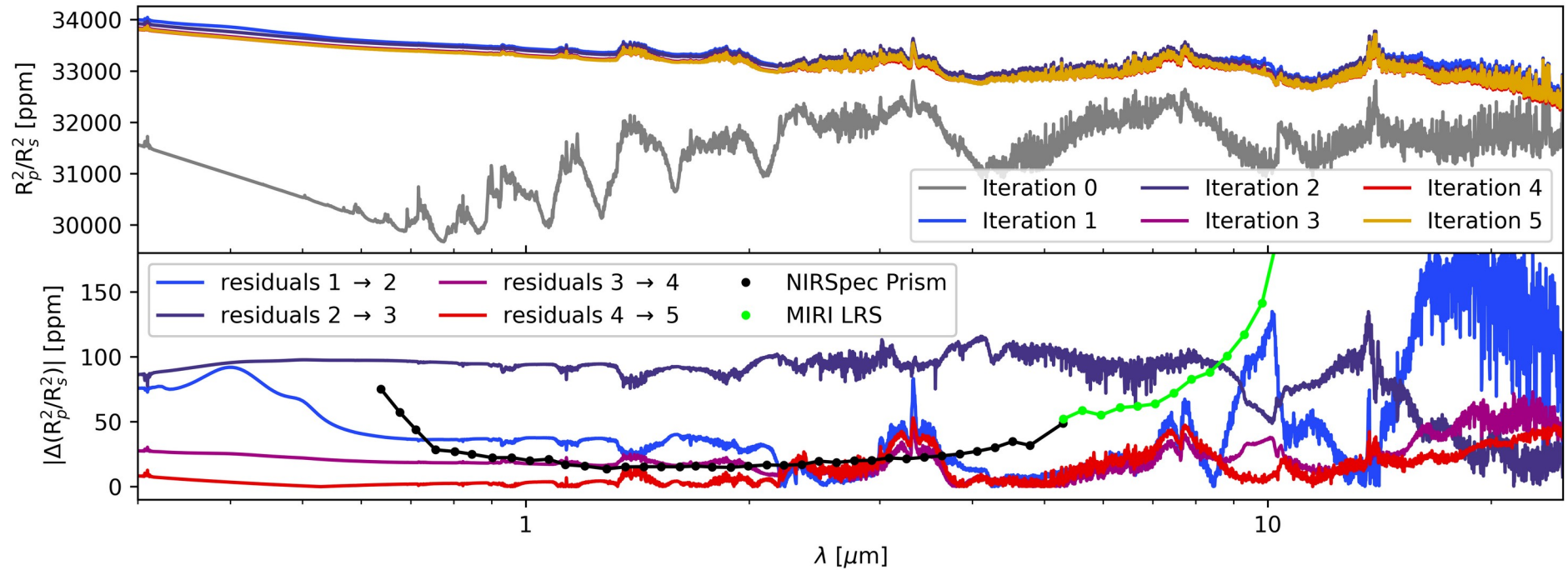
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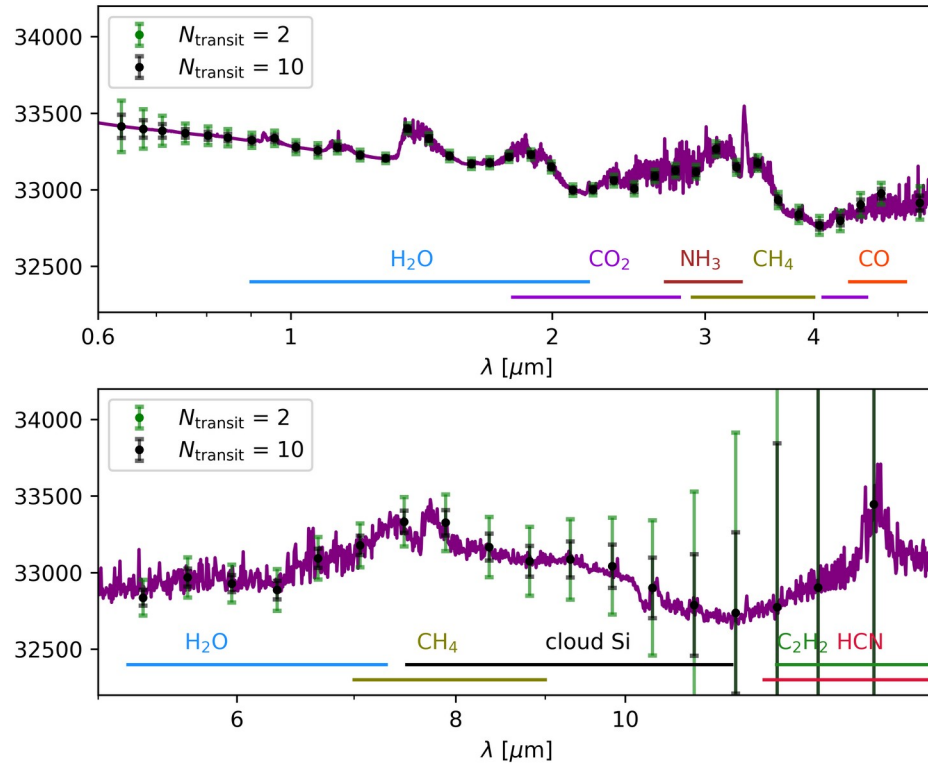
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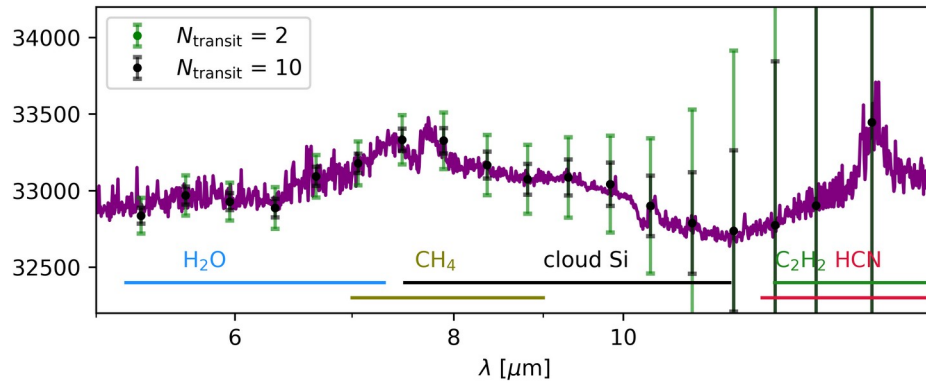
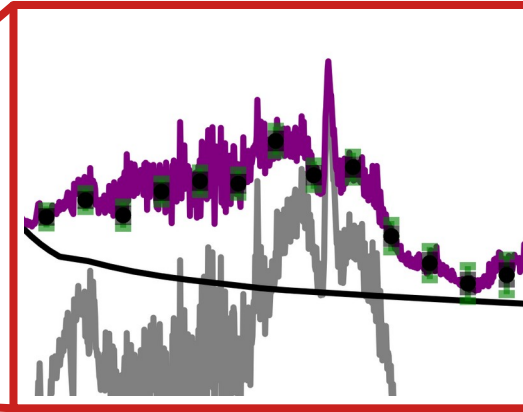
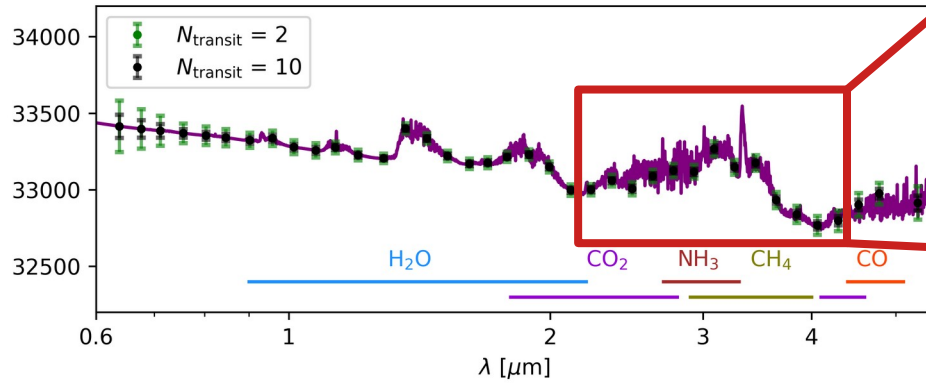
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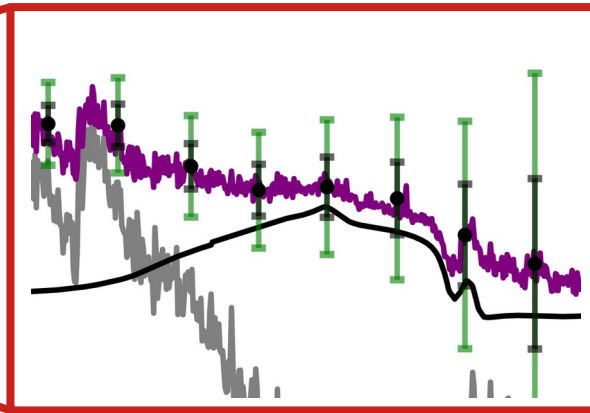
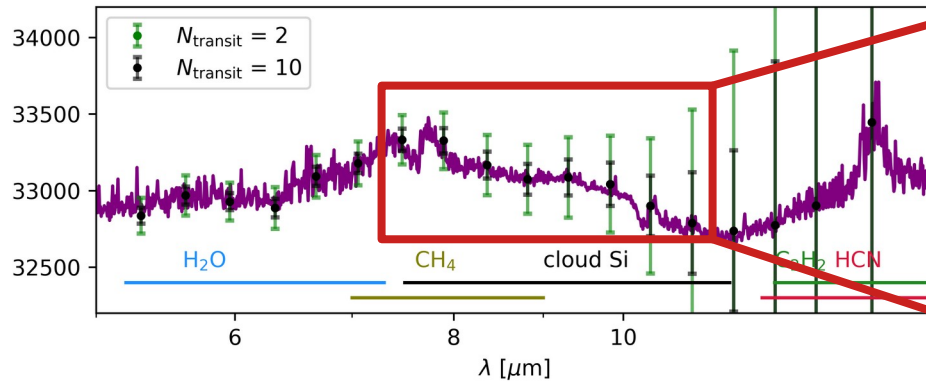
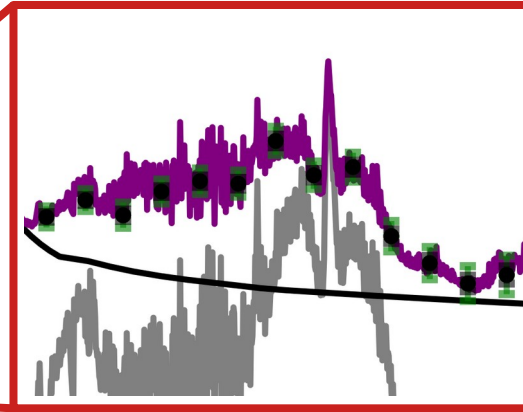
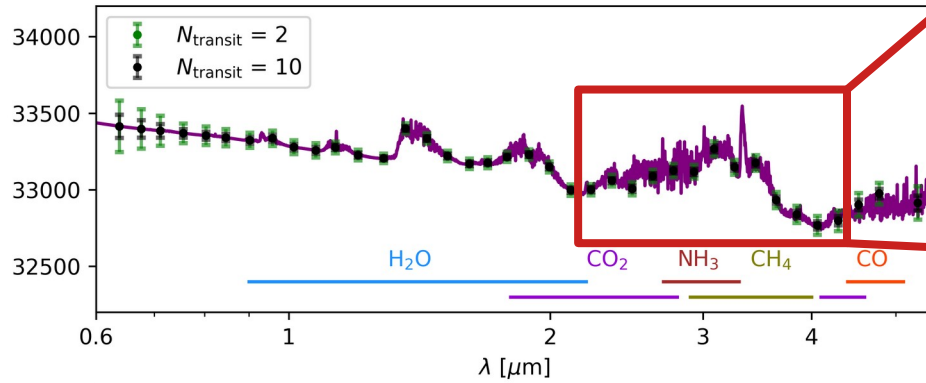
Observing HATS-6b



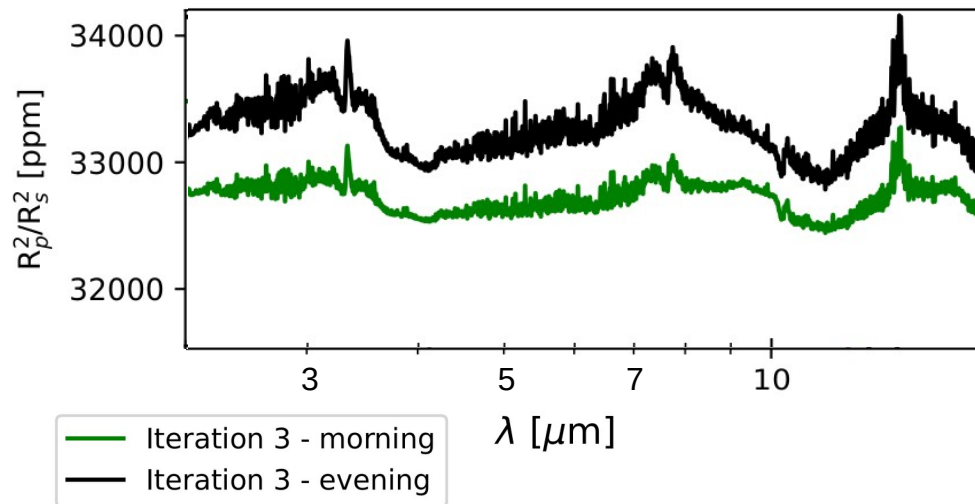
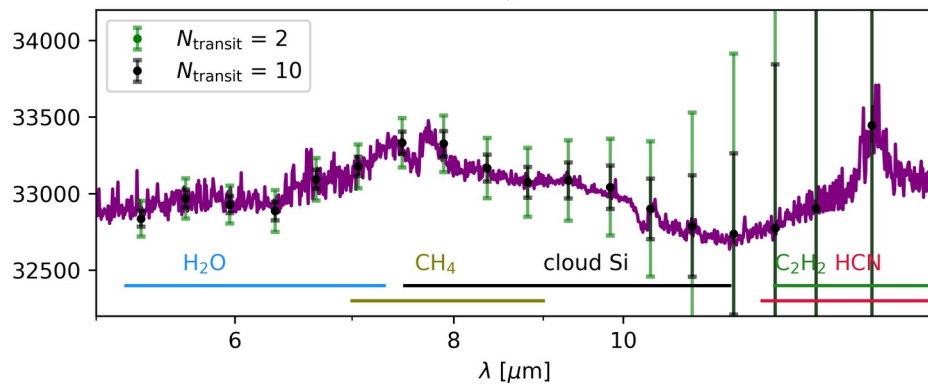
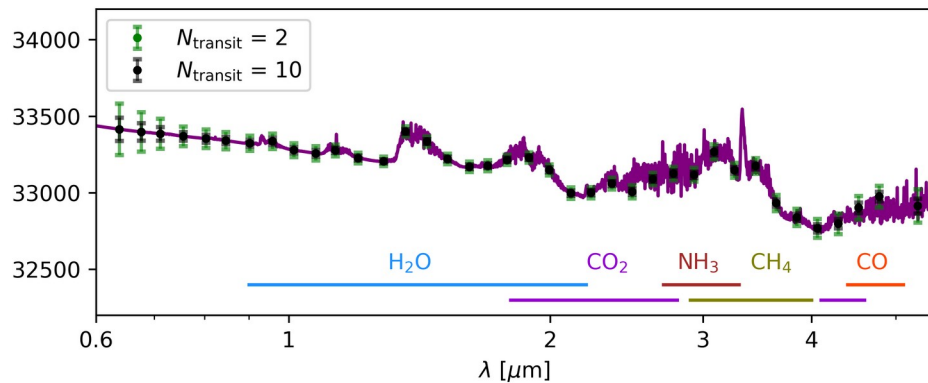
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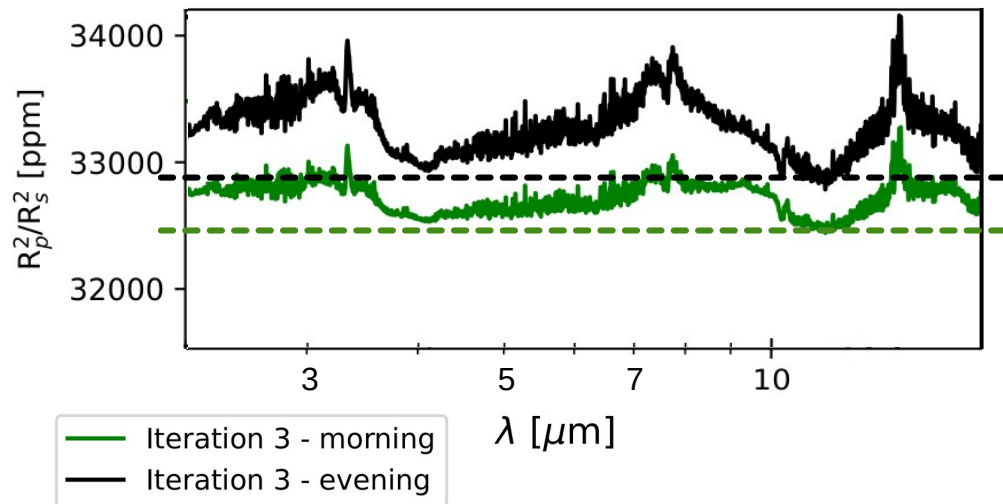
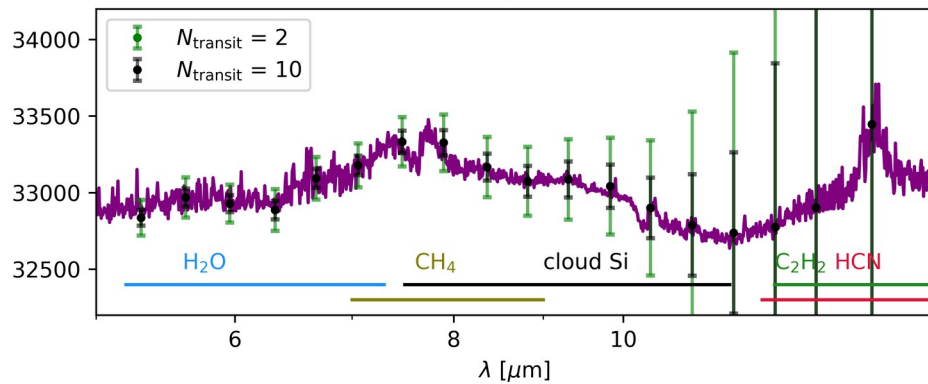
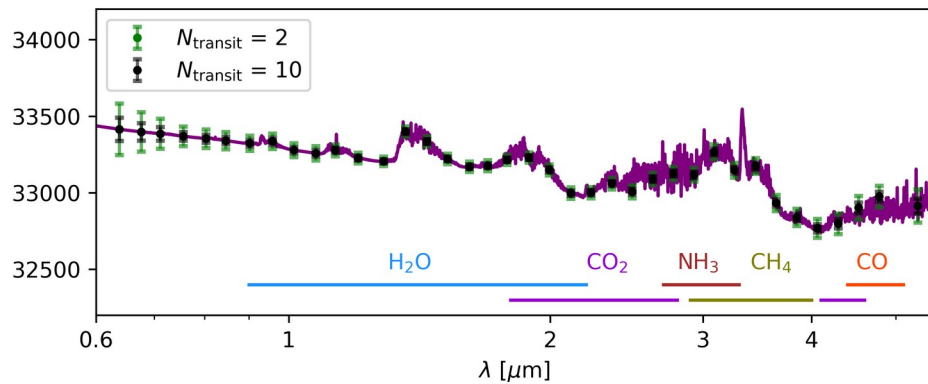
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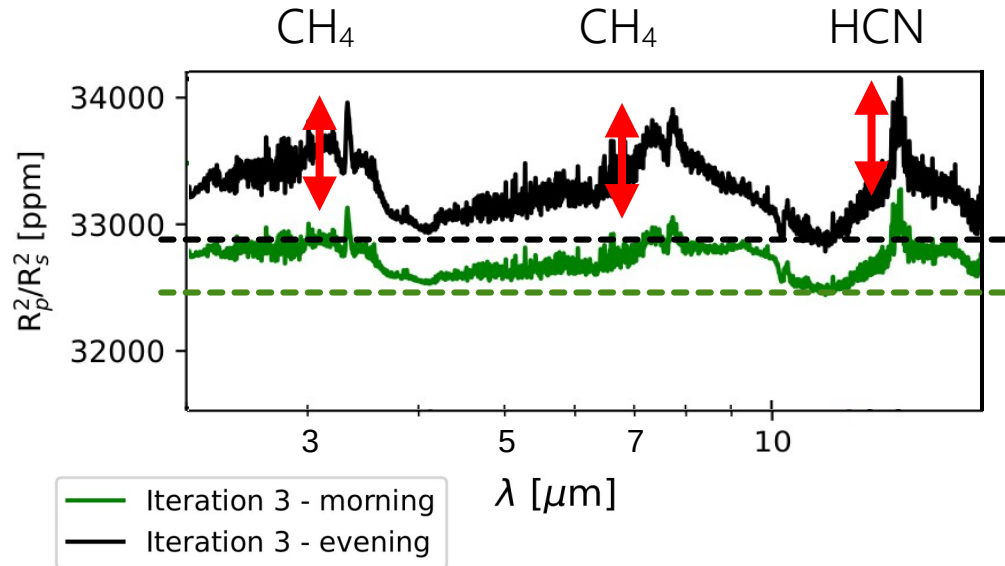
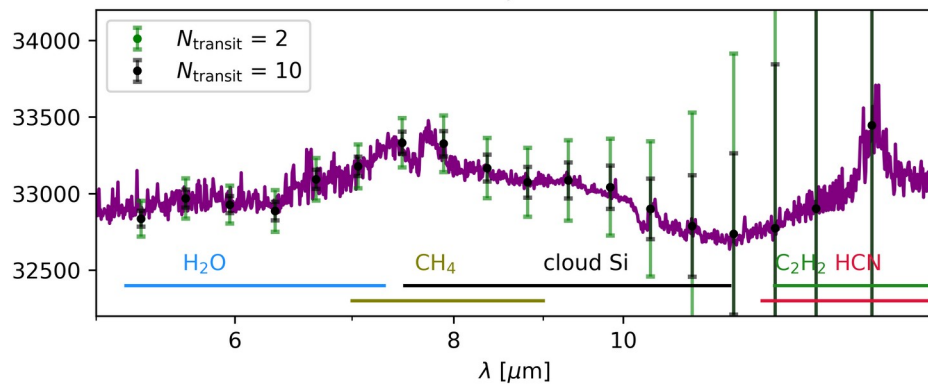
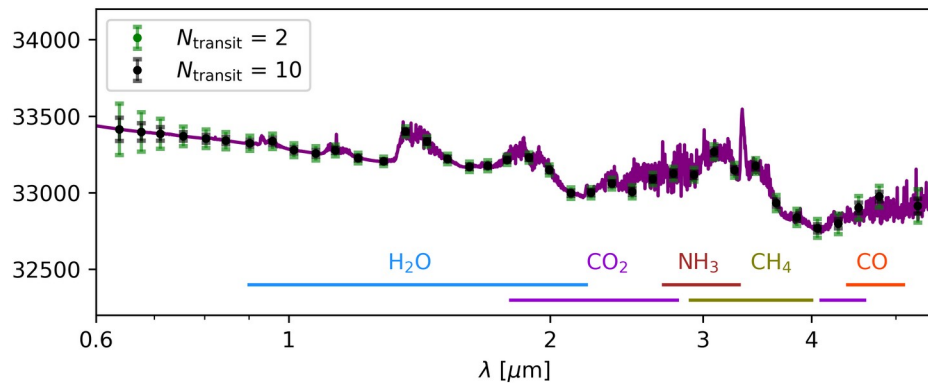
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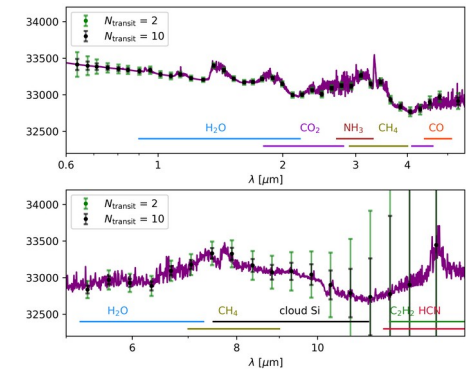
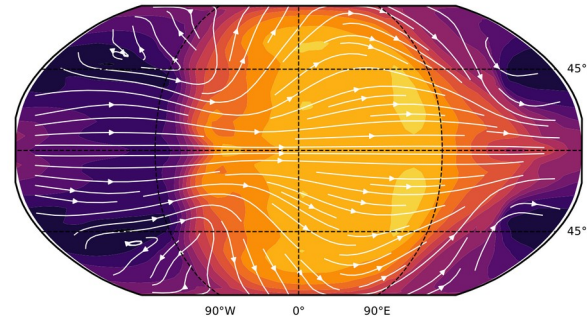
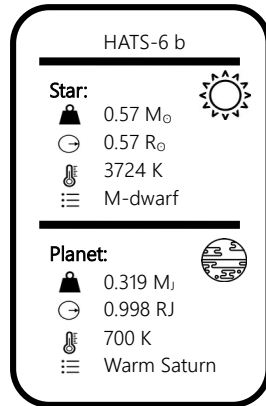
Summary



HATS-6b is a strongly irradiated warm Saturn with a favorable transit depth

The global cloud coverage strongly impacts the temperature and wind structure

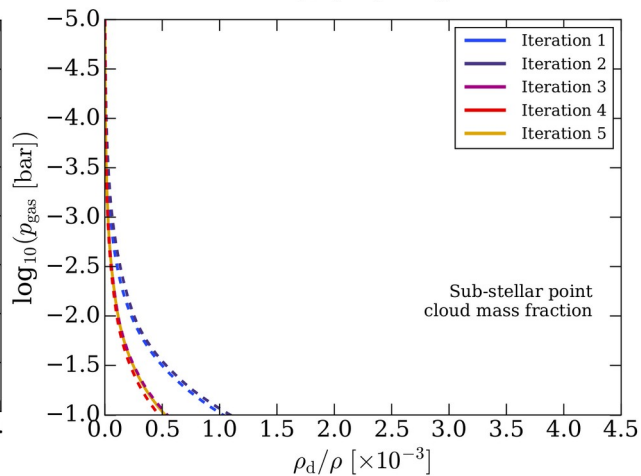
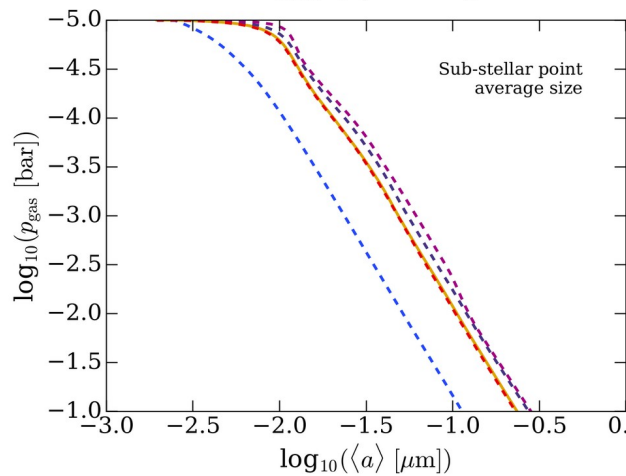
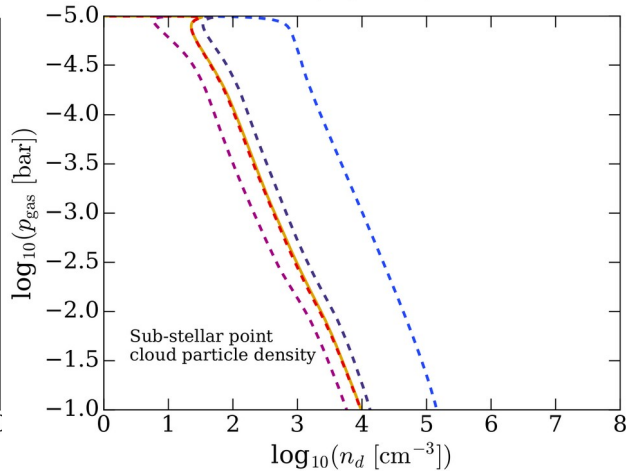
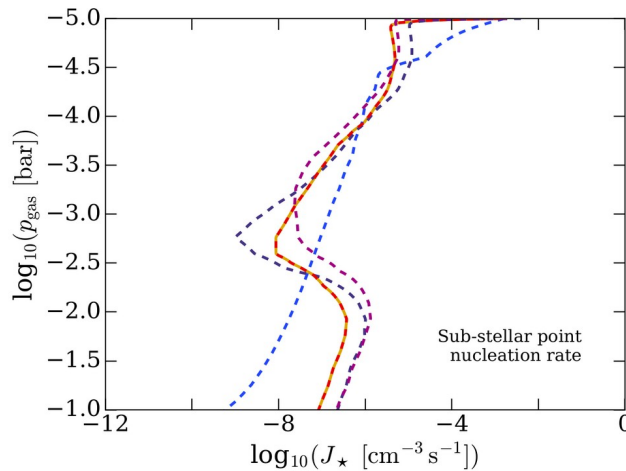
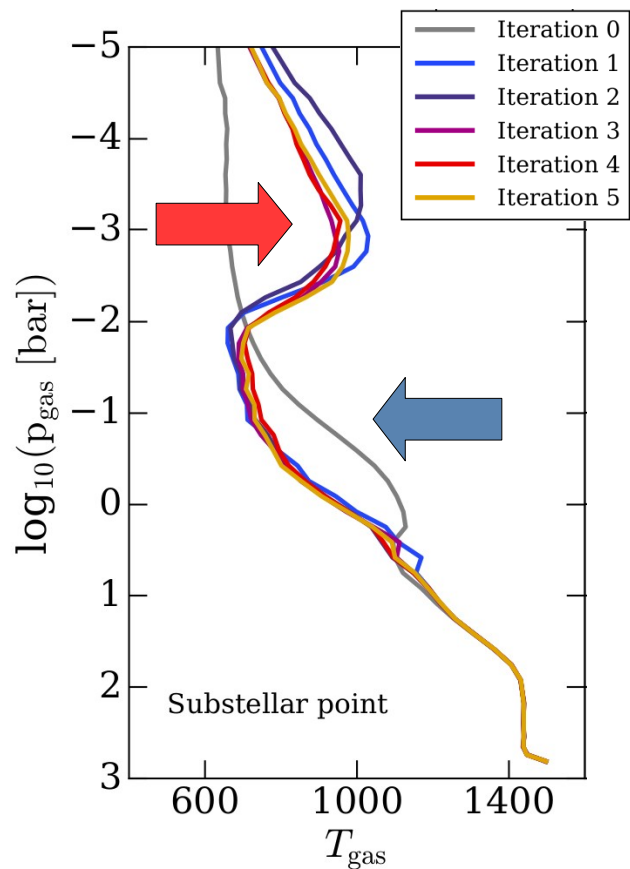
HATS-6b has observable gas-phase and cloud particle features



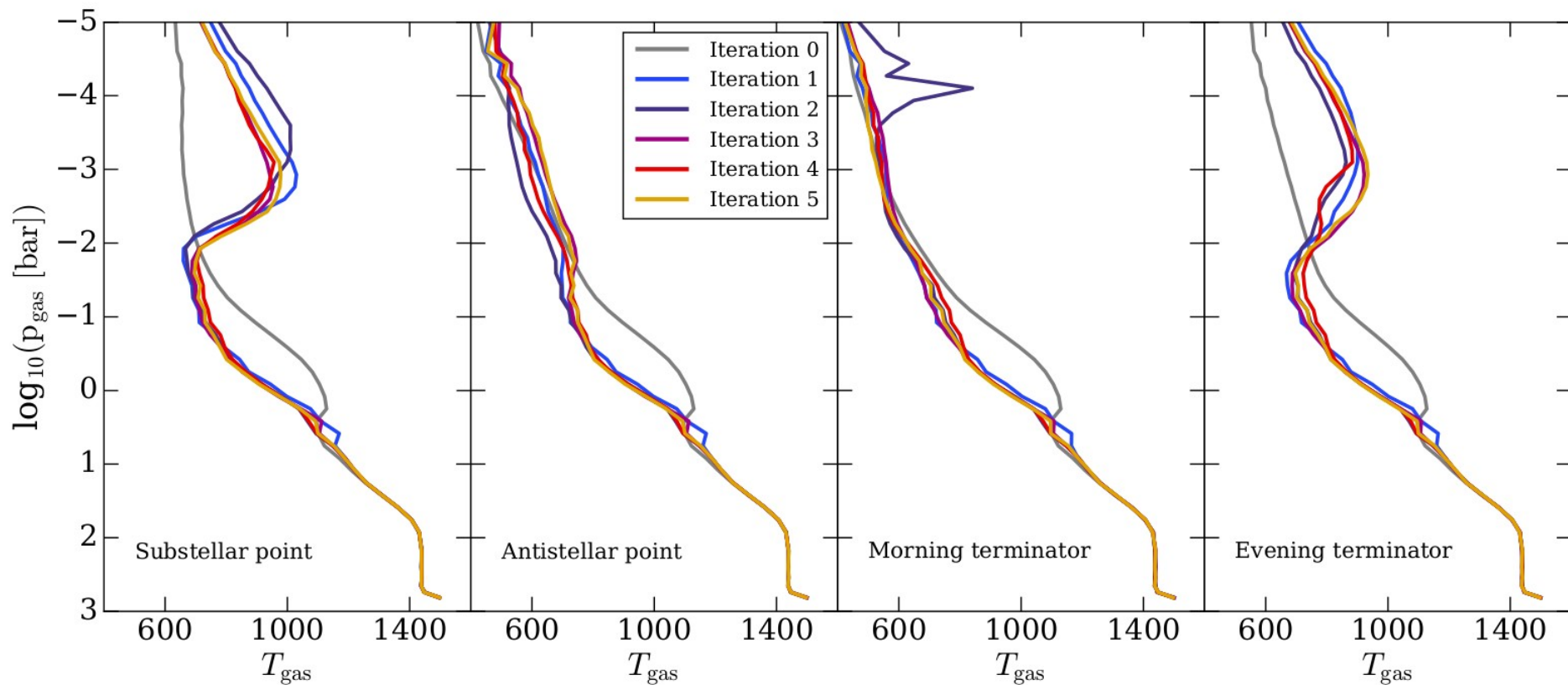
Additional Slides

Clouds in 3D

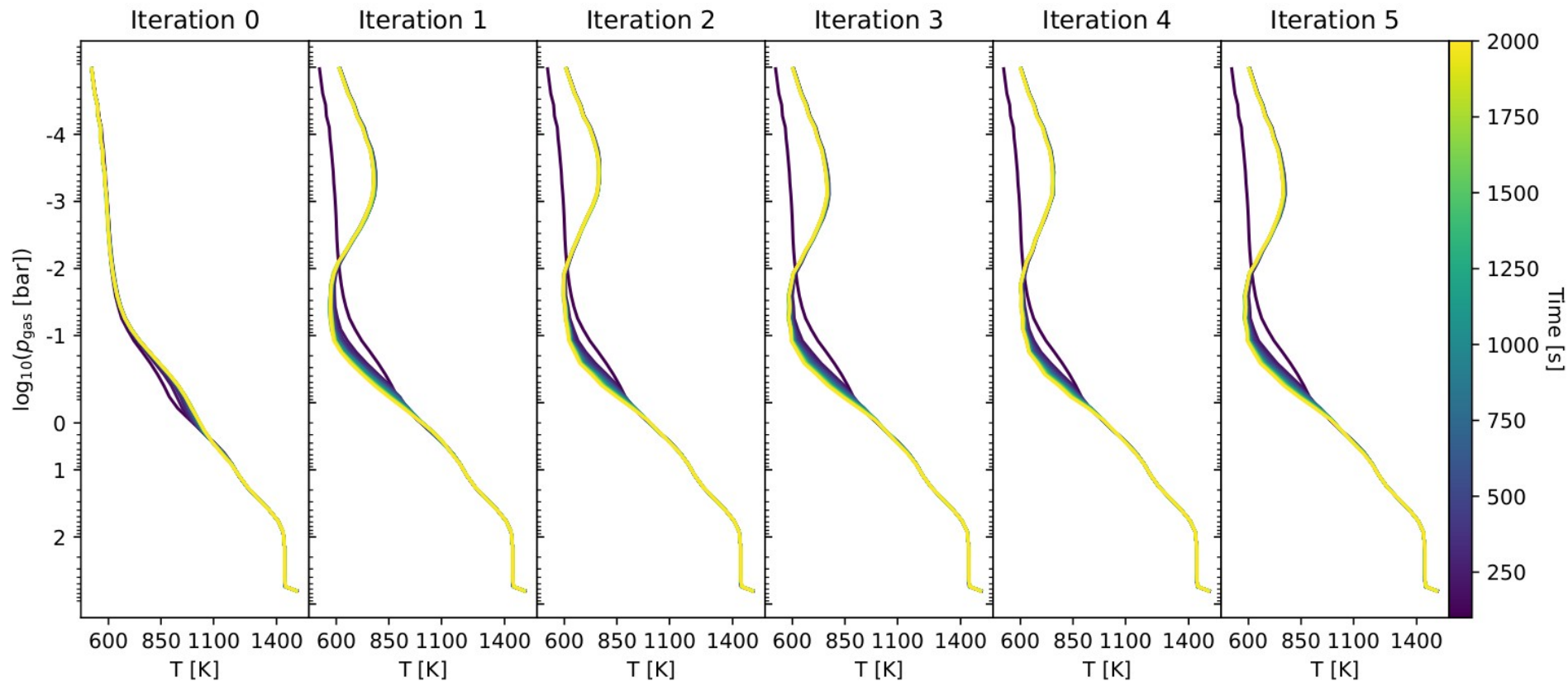
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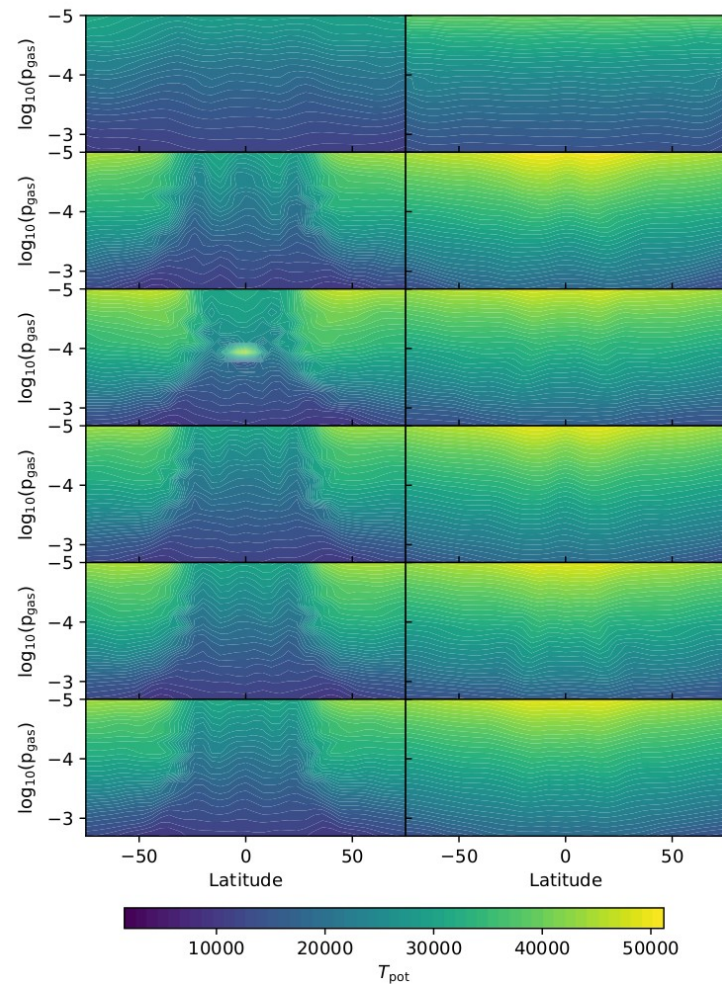
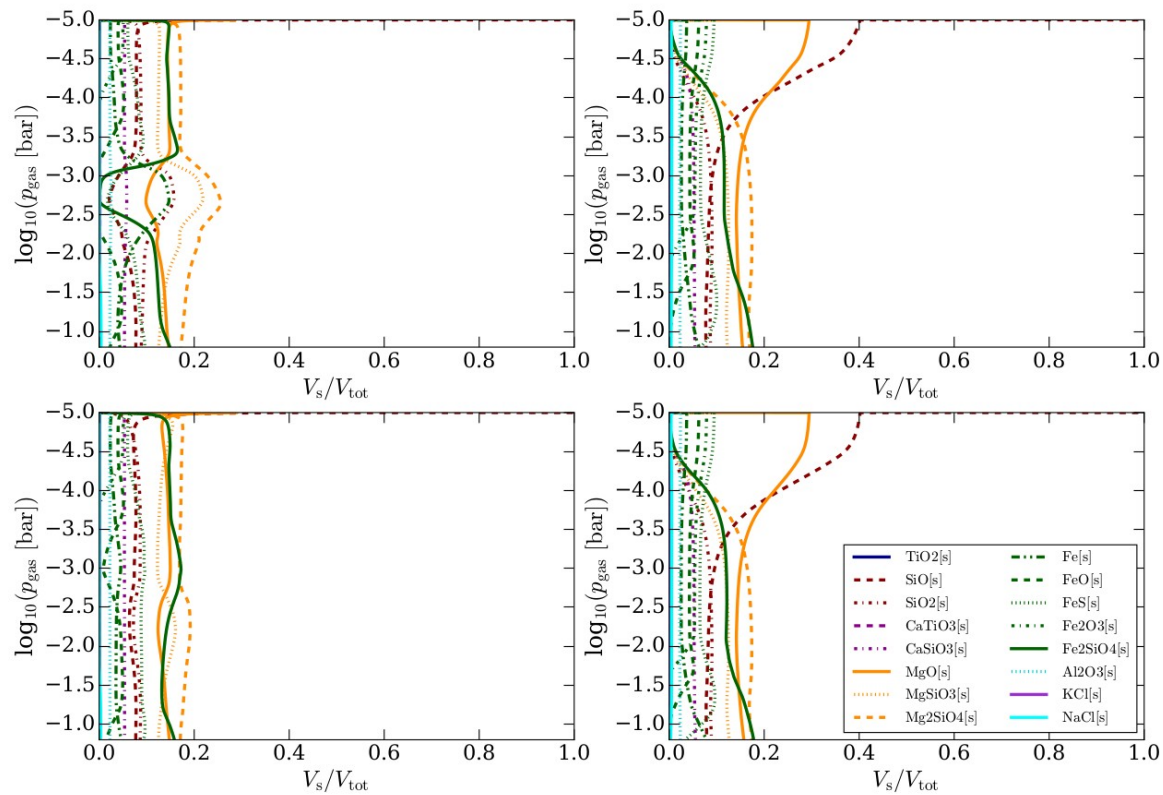
HATS-6b



HATS-6b



HATS-6b



HATS-6b
