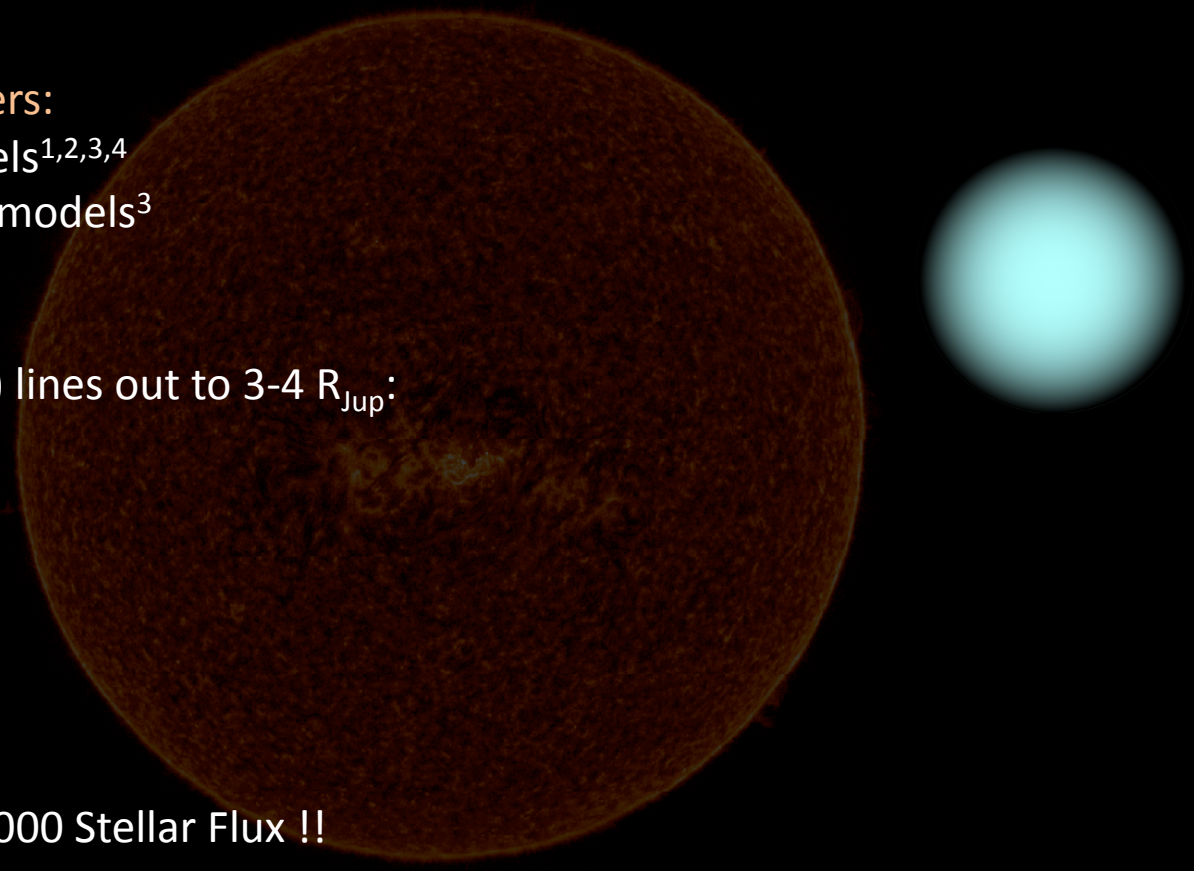
UV Emission From HD209458b

Everett Schlawin



Exospheric Parameters:

- 10,000 K from models[1,2,3,4]
- $n_H = 10^{16}$ cm^{-3} from models[3]

- Observations[5,6,7,8]:

Optically thick ($\tau > 1$) lines out to 3-4 R_{Jup}:

Si III

O I

H I

C II

LTE Emission:

$B_\upsilon(10^4\ K)\Delta\upsilon\Delta\Omega$ = 20,000 Stellar Flux !!

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4. Koskinen, T. T., Yelle, R. V., Lavvas, P., & Lewis, N. K. 2010, ApJ, 723, 116 5. Vidal-Madjar, A., Lecavelier des Etangs, A., D´esert, J., Ballester, G. E., Ferlet, R., H´ebrard, G., & Mayor, M. 2003, Nature, 422, 143
6. Vidal-Madjar, A., D´esert, J., Lecavelier des Etangs, A., H´ebrard, G., Ballester, G. E., Ehrenreich, D., Ferlet, R., McConnell, J. C., Mayor, M., & Parkinson, C. D. 2004, ApJ, 604, L69
7. Linsky, J. L., Yang, H., France, K., Froning, C. S., Green, J. C.,Stocke, J. T., & Osterman, S. N. 2010, ApJ, 717, 1291
8. Ehrenreich, D., Lecavelier Des Etangs, A., H´ebrard, G., D´esert, J.-M., Vidal-Madjar, A., McConnell, J. C., Parkinson, C. D.,Ballester, G. E., & Ferlet, R. 2008, A&A, 483, 933

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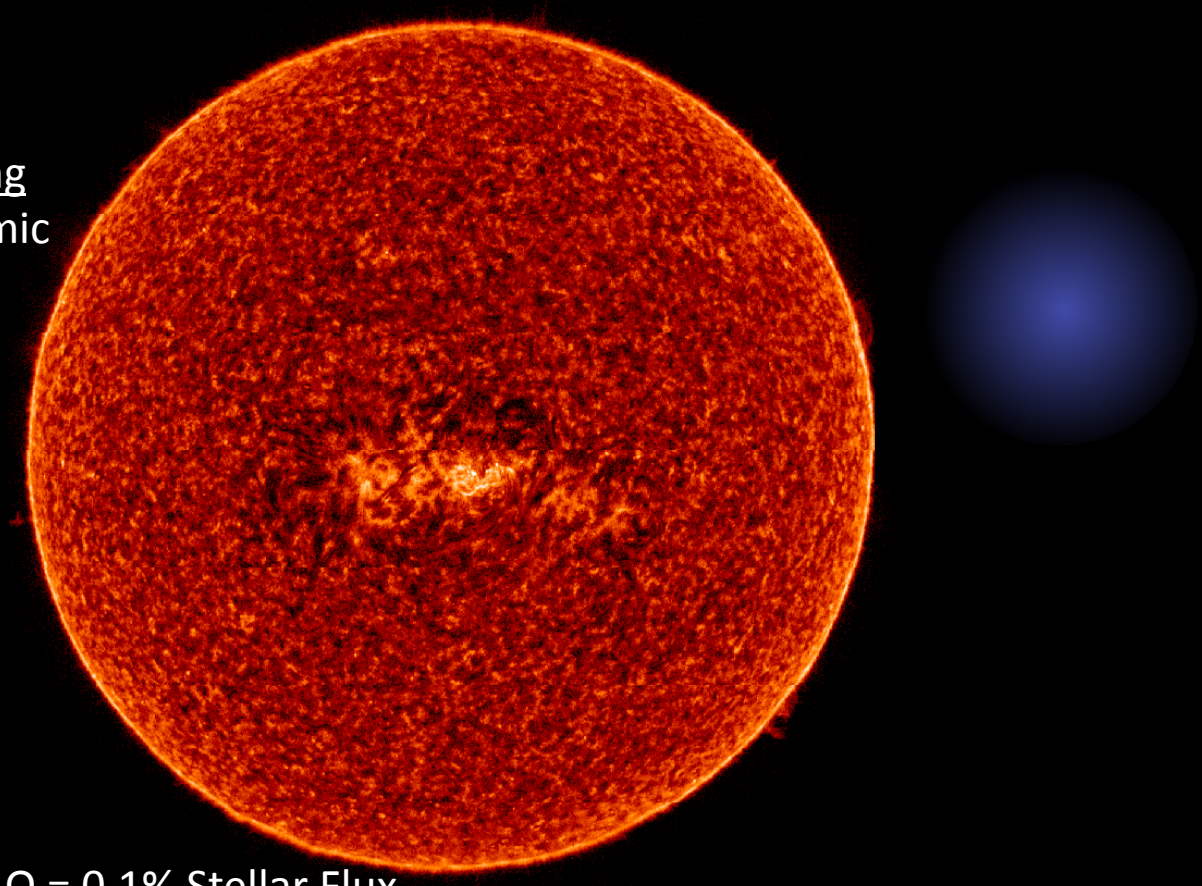
Solution:

Resonance Scattering

Not in thermodynamic Equilibrium



NLTE Emission:

$6 \times 10^{-8} B_{\upsilon}(10^4\ K) \Delta\upsilon \Delta\Omega = 0.1\%$ Stellar Flux

Sun observed by SUMER on 12/13 May 1996 in the emission line of S VI at 933Å
http://www.astropa.unipa.it/aol/soho/SUMER/sum002.html