

**The upper atmosphere of 55 Cnc e.** X. C. Zheng<sup>1</sup> and F. Tian<sup>2,3</sup>, <sup>1</sup> *Kavli Institute of Astronomy and Astrophysics, Peking University, Beijing, China* (x.c.zheng1989@gmail.com), <sup>2</sup> *National Astronomical Observatories, Beijing, China* (tianfengCO@gmail.com), <sup>3</sup> *Center for Earth System Sciences, Tsinghua University, Beijing, China.*

**Introduction:** 55 Cnc e is a hot super-Earth transiting a naked-eye star with mean density less than that of the Earth [1,2]. UV observations do not detect any transit signal from 55Cnc e at Ly-alpha, indicating the absence of hydrogen in its atmosphere [3]. Recent interior model suggests that the planet could contain large amount of carbon [4]. Thus a carbon rich atmosphere is to be expected. In this work, we use a one-dimensional multi-component hydrodynamic thermosphere/ionosphere model [5] to study the upper atmosphere of 55 Cnc e. We will discuss the long term stability of the atmosphere of 55 Cnc e and will focus on the detectability of a possible extended C<sup>+</sup> cloud around the planet.

**References:** [1] Winn J.N. et al. (2011) *ApJL* 737, L18. [2] Demory B. et al. (2012) *ApJL* 751, L28. [3] Ehrenreich D. et al. (2012) *A&A*, submitted. [4] Madhusudhan N. (2012) *ApJL*, submitted. [5] Tian F. (2009) *ApJ* 703, 905-909.