

The Expanded Planet Radius Model in XUV-region by Rayleigh Scattering on HD209458b

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The short-period Hot Jupiter such as HD209458b has been speculated that the expansion of its atmosphere due to intense irradiation from its host star with close orbital distance might exist. Several observational evidences have shown that the planetary radius is relatively larger in shorter wavelengths with respect to optical wavelength by transit observation. It may imply that the planetary radius can expand in high-energy wavelengths due to Ly α absorption of HI-rich atmosphere, which is the key factor to tremendous outflow of atmospheric gas, in order words, the atmospheric mass loss. However, the expanded planetary radii in UV and X-ray region in observation are still controversial because of their high uncertainty when compared to visible region. In this literature, we will demonstrate the expanded planetary radius model with continuum spectrum by Rayleigh Scattering process, especially in X-ray & extreme ultraviolet (XUV) wavelength region, in order to assure that the estimation of atmospheric mass loss rate from XUV-absorption in this planet is approximately 10^{10} g/s, and the expansion of planetary radius is significantly reliant on the shorter wavelength flux's absorption by its atmosphere.

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