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High-resolution transit observations of Na lines and their impact on our understanding of hot Jupiter atmospheres

Panayotis Lavvas
CNRS, REIMS, France (panayotis.lavvas@univ-reims.fr)

At the high temperatures found in hot exoplanets, alkali atoms (mainly Na and K) are present in atomic form in their atmospheres, thus allowing for stong transit signals. Such signatures have been instrumental in the detection of exoplanet atmospheres. Observations obtained at high resolution, enough to resolve the strong Na doublet line absorption, can provide significant constraints for the vertical thermal structure of these atmospheres. Here we present a detailed study for the interpretation of such observations for the atmosphere of exoplanet HD 189733 b, taking into account the complex Na photochemistry, as well as, the possible impact of the heterogeneous opacities detected in this atmosphere on the interpretation of the transit signals.