TAU : An atmospheric transmission code

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With the increased interest in observational and theoretical study of extrasolar planets in recent years, atmospheric retrieval and the ability to characterise such objects have become prominent areas of current research. In particular this has led to consideration of the effects that the presence of atmospheric hazes and cloud layers may have on the observations of exoplanets, and recent discussions concerning the interpretation of exoplanetary spectra have brought these issues to the fore.

We present here a code to model one-dimensional radiative transfer in exoplanetary atmospheres, in the primary transit, or terminator, geometry. This code is designed to be able to produce a first order estimate of the transmission spectrum one may expect to observe from an object, given a modelled atmospheric temperature structure and molecular composition, and has been used for previous studies of hot-Jupiters such as HD189733b (Waldmann et al., 2013) and WASP-12b (Swain et al., sub.). Also incorporated within the code is a simple scheme to estimate the effects of additional opacities due to scattering particles and cloud layers, an important and timely inclusion given the current focus of the atmospheric retrieval field, the application of which will be demonstrated in an upcoming study (Hollis et al., in prep.).