

# Transit Spectroscopy of the Extrasolar Planet HD 209458b: The Search for Water

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An attempt to detect water in the atmosphere of the extrasolar planet HD 209458b using transit spectroscopy will be presented. A radiative transfer model designed and built specifically for this project predicts, given a planetary temperature/pressure/composition profile, the dependence in wavelength of the stellar spectrum modulation due to a transiting planet. A total of 352 spectra around 1.8 microns were obtained on four nights (three in transit) of observations using ISAAC at the Very Large Telescope.

Correlating the modeled modulation with the infrared spectra yields a non-detection of water in the atmosphere of HD 209458b. However, a quantitative model of an improved observing strategy for future observations of this kind is presented as well as original data-reduction techniques that were developed during this work.