Contribution ID: **6** Type: **PIC2 Project**

Transmission Spectroscopy using exoplanet's high resolution spectra

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In this project, the presence of the sodium doublet (NaI D1 and D2) was detected in the Wasp-76b atmosphere's transmission spectrum, an ultra-hot Jupiter. First, it is done an introduction about this planet's characteristics and the methods that were used to obtain all the spectra. It was analyzed 70 high-resolution spectra from ESPRESSO (Echelle Spectrograph for Rocky Exoplanet- and Stable Spectroscopic Observations) instrument at the Very Large Telescope (VLT) of an 2018's night. Then, it was done the first corrections of the spectra which include the correction of the time and the Doppler shift to the star's rest frame. After that, it was obtained the weighted average of all the spectra with non transit exposures (master-out), without the contribution of Earth's atmosphere, the noise and the strong telluric features. Furthermore, it was divided all the spectra by the master-out and the Wiggles correction were done and the final shift to the Planet's rest frame. Finally, with another weighted average, it was obtained the final spectrum with transit exposures (master-in). In the end, it was calculated the quality of the detection (significance), with values of 9.27σ and 8.52σ which are quite good, because it is considered a detection from 5σ of significance.

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