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Search for HDO in the astronomical spectroscopic archives of the Observatoire de Haute-Provence

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Astronomical spectroscopic archives of Observatoire de Haute Provence is a database of high-resolution spectra of astronomical objects (spectral domain: 385 nm to 680 nm; sampling 0.005 nm; resolution: 0.0065 nm) obtained with the Elodie spectrograph on a 193-cm diameter telescope at Observatoire de Haute Provence (5 ° 42' E, +43° 55' N, altitude 681 m). Note that Sophie spectrograph replaced the Elodie Spectrograph in July 2005 and the Sophie archive is also open to the community. More than 20 000 spectra of stars and other astrophysical objects are available in these archives accessible using an online web service or php protocol. This database is updated regularly, when spectra with restricted access are opened to the community, or after updating the pipeline of the processing.

Our spectral analysis to retrieve H2O is composed of cyclic procedures, varying spectral resolution of water vapor cross-section, spectral shift of water vapor cross-section and the total column of water vapor molecules per surface area in line-of-sight for each individual spectra. Seasonal variability of water vapor as well as a preliminary study of its trend above the observatory is possible because of the high quality of the available data. Astronomy can provide valuable past and present observations useful for atmospheric science, and this should be explored further.

We are exploring here the possibility to retrieve HDO using similaire technique and extending it to differential methods. Results of our study will be presented here.