The exploitation of the JWST data for the characterization of planetary atmospheres: The case of VHS1256 b

Last year was published the most complete spectrum ever obtained for an imaged exoplanet with JWST data of the companion VHS 1256 b. This spectrum covers a wide range of wavelengths (1 to 18 microns) at medium resolution (R~3000) allowing access to previously unavailable spectral information. The estimation of the atmospheric properties of the observed planets by exploiting this new spectral complexity is one of the main current challenges of exoplanetary sciences.

In this context, we have developed an optimized spectral inversion tool called ForMoSA that compares data with the latest generation of atmospheric models following the forward modeling approach in order to estimate some key atmospheric properties (effective temperature, surface gravity, chemical abundances) that can then be used to constrain the formation and evolution mechanisms of planetary mass objects.

During my presentation, I will start with a quick introduction of the ForMoSA code (available to the community), then I will present my analysis of the VHS 1256 b JWST data in the context of the Early Release Science program through the use of five different models. I will propose my conclusions regarding the current limitations of the forward modeling approach and a method to overcome them in order to produce the most robust characterization possible.