



Looking at the key atmospheric gases in Titan: PACS / Herschel Spectrum of Titan

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Within the framework of the Herschel guaranteed time key project called “Water and related chemistry in the Solar System”*, new insights into Titan’s atmosphere are being facilitated by data from all three Herschel instruments (Heterodyne Instrument for the Far Infrared (HIFI), Photodetector Array Camera and Spectrometer (PACS), and Spectral and Photometric Imaging REceiver (SPIRE)). The Far-IR and submillimeter range (51 - 220 microns) of Titan’s PACS spectrum is observed for the first time during June and December 2010, with a resolving power from 940 to 5500 depending of the wavelength. The spectrum shows many lines due to H₂O, HCN, CH₄, and CO. By means of a line-by-line radiative transfer code we present the PACS observations and synthetic spectrum of Titan. The combined initial analysis of key rotational lines yields constraints on both the temperature and the abundances in Titan’s atmosphere. Furthermore, this study attempts to contribute to a more thorough understanding of the physical phenomena in Titan’s atmosphere.

*also known as “Herschel Solar System Observations” (HssO) project