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Retrieval Simulations of Atmospheric Gases of Titan in preparation of Herschel

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Abstract

The origin of Titan's atmosphere is poorly understood and its chemistry is rather complicated. In the framework of the Herschel guaranteed time key project called ``*Water and related chemistry in the Solar System*"*, an amount of observational time for Titan is considered, using all three Herschel instruments (Heterodyne Instrument for the Far Infrared (HIFI), Photodetector Array Camera and Spectrometer (PACS), and Spectral and Photometric Imaging REceiver (SPIRE)) [1].

Here we present calculations of the expected spectra in the Herschel wavelength range and investigate the possibility to retrieve vertical profiles of temperature and water mixing ratio with the spectral resolution of HIFI, and temperature and H_2O, HCN, and CO mixing ratios with PACS in Titan's atmosphere for the expected signal-to-noise ratios [2]. Our results in preparation for Herschel show our technique to be a promising tool for the analysis of Titan's atmospheric data.

*also known as ``*Herschel Solar System Observations*" (HssO) project, the HssO team consists of 50 individuals from 21 institutes in 10 countries

References

[1] Hartogh, P., et al (2009) Planetary and Space Science, submitted.

[2] Rengel, M. et al. (2009), Advance in Geosciences, accepted.