

Seasonal variations in Titan's stratosphere observed with Cassini/CIRS: temperature, trace molecular gas and aerosol mixing ratio profiles

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Titan's northern spring equinox occurred in August 2009. General Circulation Models (e.g. Lebonnois et al., 2012) predict strong modifications of the global circulation in this period, with formation of two circulation cells instead of the pole-to-pole cell that occurred during northern winter. This winter single cell, which had its descending branch at the north pole, was at the origin of the enrichment of molecular abundances and high stratopause temperatures observed by Cassini/CIRS at high northern latitudes (e.g. Achterberg et al., 2011, Coustenis et al., 2010, Teanby et al., 2008, Vinatier et al., 2010). The predicted dynamical seasonal variations after the equinox have strong impact on the spatial distributions of trace gas, temperature and aerosol abundances.

We will present here an analysis of CIRS limb-geometry datasets acquired in 2010 and 2011 that we used to monitor the seasonal evolution of the vertical profiles of temperature, molecular (C_2H_2 , C_2H_6 , HCN, ...) and aerosol abundances.

References:

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