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Titan's atmospheric temperature profile from Cassini - Huygens ASI and CIRS measurements.

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The atmospheric structure of the Titan has been sounded in situ by the Huygens probe and by Cassini remote sensing during the Titan's flybys.

The Huygens Atmospheric Structure Instrument (HASI) has measured the temperature profile from 1400 km down to ground combining the accelerometric data and direct pressure and temperature measurements (Fulchignoni et al., 2005). A thermal profile has been retrieved in the altitude range between 80 km up to 450 km from the Cassini Composite Infrared Spectrometer (CIRS) data during the Titan Tb flyby (Flasar et al., 2005).

In this paper we concentrate in the part of the atmosphere between the ground and the stratopause (second temperature inversion) and compare CIRS findings from latitudes associated with the Huygens landing site and the HASI-retrieved temperature profile. We also compare the temperature profile found by HASI and CIRS with temperature inferences from CO and HCN rotational lines heterodyne measurements taken with the IRAM interferometer in 2003-2005 reaching higher atmospheric levels up to 800 km (Marten et al., 2006, in preparation). The combination of the all this information should provide a very reliable insight on the thermal structure of Titan in its neutral atmosphere. The thermal structure and stability of Titan's atmosphere will also be discussed.

References

Flasar et al., 2005, Science 308, 975.

Fulchignoni et al., 2005, Nature 438, 785.