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1 Remote sensing of Titan's troposphere with the CIRS instrument on Cassini

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We have analyzed far-infrared spectra of Titan recorded with the Composite Infra-Red Spectrometer during the first three years of the Cassini orbital tour. In the far-infrared, between 30 and 500 cm^{-1}, Titan's thermal emission continuum is predominently radiated by the tropospheric and lower stratospheric layers ($i.e.$ from the surface up to 60 km altitude), with a small contribution from the photochemical haze at higher altitudes. Besides the collision-induced absorption due to the main gaseous constituants (N_2, CH_4, and H_2) and scattering from the haze, tropospheric condensation clouds, mists or rains may also play a significant role in shaping the overall opacity of these layers. We will discuss the present state of our modeling of the CIRS spectra over a wide of range of latitudes, and the preliminary insights it provides on the lower regions of Titan's atmosphere.