



Fluorescence of methane in Titan and Saturn observations by Cassini/VIMS experiment

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Observations of Titan and Saturn by the Cassini VIMS experiment show prominent CH₄ emission in the ν_3 fundamental at 3.3 μm , with a pronounced limb brightening. These emissions are due to fluorescent emission by methane in a non-LTE regime in the upper atmosphere. On Titan, the VIMS spatial resolution of successive flybys allows the detection of the glowing maximum at ≈ 400 km. A model of non-LTE emission in spherical geometry for limb observations allows us to retrieve the observed feature with constant mixing ratio of methane with altitude, at $\approx 2\%$. No variation with latitude are observed along the limb, implying a fairly well distributed methane concentration on the full disk of Titan in the upper atmosphere. Below 300 km, discrepancy with the model are attributed to a contribution of haze scattering in the radiative transfer, compared to a purely gaseous atmosphere. On Saturn, similar fluorescent emission of CH₄ are observed; constraints on the altitude of CH₄ emission will be studied in order to measure the eddy diffusion coefficient of the upper atmosphere at various latitudes.