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3D modeling of organic haze in Pluto's atmosphere

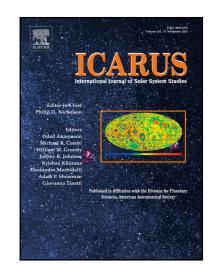
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1 Highlights

- We obtained a maximal photolysis rate of CH4 of 1.3x1021 g cm-3 s-1 in
- 2015, at 250 km altitude, and a haze extending up to 500 km altitude with
- a density scale height of 40 km.
- Due to the weak meridional circulation, the haze precursors are not easily
- transported in the lower atmospheric layers and remain at high altitudes
- and in larger amount at high northern latitudes, leading to a more extensive
- 8 haze in the northern hemisphere.
- If we assume a condensation flow of N2 from the northern towards the south-
- ern hemisphere, then the haze precursors can be transported faster at lower
- altitude above the south pole, leading to a latitudinally more homogeneous
- haze density.
- The column mass of haze computed by our model primarily depends on
- the sedimentation velocity and thus on the pressure and the considered
- monomer radius. Between 1990 and 2015, the column mass of haze obtained
- follows the trend in surface pressure: an increase by a factor of 3.
- We computed the UV and VIS opacities of the haze as a diagnostic of our
- simulation results and in all simulation cases, the column visible opacities
- have similar values around 0.001-0.01 (slightly higher for large fractal par-
- ticles).

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