Aerosols in the atmospheres of the Ice Giants

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Abstract

Different observations of Uranus and Neptune have revealed the presence of hazes and discrete clouds at different locations and time periods. Based on the altitude of these clouds and the saturation vapour pressure curves of several possible condensates in the atmosphere, it has been possible to infer the composition of these clouds. However, as a result of the limitation of ground-based telescopes (or observations from telescopes in orbit around the earth) the detection and analysis of the composition and properties of those clouds is a big challenge. In this work, we will make use of radiative transfer and cloud microphysics simulations to provide key constraints on the density, vertical distribution, size of droplets and time scale of the different aerosols that may be present in Uranus and Neptune atmospheres. We will also analyse the limitation of the actual ground-based telescopes to infer some aerosols properties such as the haze fractal structure, and how in situ observations may provide additional constraints to better understand the structure, formation and evolution of aerosols in the atmospheres of the Ice Giants.

Keywords: Aerosols, Radiative transfer, Microphysics

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