# Storms and convection formation on (Exo)Neptune revealed by a cloud resolving model

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Despite the little insolation received by the ice giant planets, the storm activity of their atmospheres is intense. What is the phenomenon responsible for this activity? Interestingly, unlike the Earth, the species able to condense in the atmospheres of Uranus and Neptune, methane in particular, are heavier than the ambient air, essentially hydrogen. Several exoplanets, warm Neptunes for example, with hydrogen-dominated atmospheres also share the same property. This property makes convection difficult to start [1,2]. Convection in these atmospheres should therefore be a regime of strong intermittence where convective energy can be stored for a long time before being released in short episodes. Our hypothesis is that this regime is at the origin of intense storms. To study this hypothesis, we use a 'cloud-resolving' model. This model is built from a dynamical core (The Weather Research and Forecasting model), that has been initially developed for terrestrial applications and already adapted for simulations on Mars and Venus [3,4], coupled to independent physical parameterizations such as radiative transfer. The high resolution of the model grid can allow us to highlight dry but also moist atmospheric convection, by resolving cloud formation and dissipation. Our implementation of methane cycle in this model has shown how important its impact in tropospheric convection on Uranus and Neptune can be. We will present a study of the intensity and periodicity of storms and cloud forming events, having a special look on the impact of the condensable species mixing ratio in the deep atmosphere.

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