

EGU21-10741

<https://doi.org/10.5194/egusphere-egu21-10741>

EGU General Assembly 2021

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## Short-lived storms inside long-lived cyclones: Simulations of the 2020 storm in the South Temperate Belt

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Convective storms on Jupiter usually develop in the cyclonic side of the jets or inside cyclones (Vasavada and Showman, 2005). On 31 May 2020 a convective storm developed inside a small cyclone (3° in longitudinal extent) in the South Temperate Belt at planetographic latitude 30°S. The storm outbreak was captured by amateur astronomer Clyde Foster becoming widely known as Clyde's spot. The storm was observed 2.5 days later by JunoCam with images displaying an apparent cyclonic structure with two main lobes and high-clouds observable in the methane absorption band. Analysis of these observations show the storm in a decaying phase with associated weak winds. Observations over the following months combined with prior observations (2 years) obtained by JunoCam, HST, IRTF and amateur observers show the long-term evolution of the cyclone before and after the convective eruption. The short-lived storm made the cyclone to display large changes in morphology and colour but not in its size or latitude, except for small fluctuations around a mean latitude and mean drift rate. Ground-based infrared observations at 5 μm show the region where the vortex was located characterized by a weakly warm radiance several months after the convective outbreak, indicating a relative clearing of clouds and haze. We have used the Explicit Planetary Isentropic-Coordinate (EPIC) numerical model (Dowling et. al., 1998) to simulate the cyclone and the effects of convective storms of different strengths and durations on it. These simulations were partially guided by our previous study of a similar convective storm in a different type of cyclone: an elongated structure known as the STB Ghost at the same latitude in 2018 (Iñurrigarro et. al., 2020). Both storms and cyclones were different in terms of their size, morphology and later evolution, but our simulations suggest that in both cases the convective eruptions were of similar power but with different lifetimes indicating that the energy source is water moist convection. We compare these storms and simulations with a similar convective storm observed in 1979 by Voyager 2 at 38°S that quickly evolved into a Folded-

Filamentary Region and investigate the outcome of convective storms at different latitudes from these simulations.

References:

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