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Turbulence statistics of terrestrial Mars-analog and Martian dust devils

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Convective instabilities in the lowermost part of the atmosphere, so called the planetary boundary layer, can lead to the formation of convective vortices and form dust devils both on Earth and Mars. We performed mesoscale simulations for a Mars-analog terrestrial site, Makgadikgadi Pan - Botswana [1,2], where a state-of-the art field campaign was conducted to investigate the terrestrial dust devils, and the InSight landing site [3] using WRF/MarsWRF models [4,5]. We then combined our atmospheric modeling with in-situ observations of wind and pressure to perform a comparative boundary-layer meteorology study. We focused on the length and time of scales of turbulence and investigated the turbulent spectrum.

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