

EGU21-10128

<https://doi.org/10.5194/egusphere-egu21-10128>

EGU General Assembly 2021

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Mesospheric Gravity Wave Momentum Flux Generated by a Thunderstorm System

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An extensive and bright mesospheric gravity wave event occurred over the El Leoncito Observatory, Argentina (31.8°S, 69.3°W) during the night of 17–18 March 2016. The wave structures were exhibited in the nightglow and were easily visible to naked eye observers, a phenomenon known as a Bright Night. Analysis of a combination of ground-based and space-based data sources indicated that the event was generated by a large thunderstorm complex located to the south-east of the observation site. The event was associated with very large values of wave momentum flux: 150–300 m²s⁻², which is over an order of magnitude larger than typical. The routine seasonality of such thunderstorm systems suggests that they may contribute significantly to the role of upward coupling to the upper atmosphere and ionosphere.