EGU22-6739
https://doi.org/10.5194/egusphere-egu22-6739
EGU General Assembly 2022

Bulk cloud microphysical properties as seen from numerical simulation and remote sensing products: case study of a hailstorm event over La Plata basin

Angel Vara-Vela[1,2], Natalia Crespo[1], Noelia Benavente[1], Marcos Bueno de Morais[1], Jorge Martins[2], Vaughan Phillips[3], Fabio Gonçalves[1], and Maria da Silva Dias[1]

[1]University of Sao Paulo, Institute of Astronomy, Geophysics and Atmospheric Sciences, Department of Atmospheric Sciences, Sao Paulo, Brazil (alvv1986@gmail.com)

[2]Federal University of Technology – Parana, Londrina, Brazil

[3]University of Lund, Department of Physical Geography, Lund, Sweden

Severe thunderstorms develop over La Plata basin, in southeastern South America, more often during austral wintertime, between June and August. These systems have significant socioeconomic impacts over the region, and, therefore, a better understanding of how atmospheric drivers modulate their formation is important to improve the forecast of such phenomena. In this study, we selected a hailstorm event observed over southeastern La Plata basin during 14-15 July 2016, and simulated it using three Brazilian developments on the Regional Atmospheric Modeling System (BRAMS) model configurations, each driven by a different global forcing: Global Forecast System (GFS), Climate Forecast System version 2 (CFSv2), and ECMWF Reanalysis v5 (ERA5). The ability of the BRAMS model in simulating cloud microphysical properties was evaluated by comparing the model output with satellite- and radar-based observations. Model results showed good skill in capturing the basic characteristics of the thunderstorm in terms of the spatial distribution of hydrometeors. The location of the maximum concentrations of hydrometeors was realistically represented by all simulations; however, slight to moderate differences in cloud properties between observations and model simulations were observed, with BRAMS/CFSv2 and BRAMS/ERA5 simulations performing best and worst, respectively, against measurements. In addition, these two simulations were able to reproduce ground-level hail concentrations over some of the reported hail fall areas. This study provides a first assessment of the BRAMS model to reproduce microphysical features of a severe thunderstorm captured by remote sensing observations over southeastern La Plata basin, one of the most hail-damage prone areas in the world.