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Poster.2: . **Mechanisms behind the occurrence of convective systems in Northwestern South America: results from a cloud-resolving simulation**

[1]**K. Santiago Hernández**, [1]**Sebastián Gómez-Ríos**, [1]**Juan J. Henao**, [1]**Vanessa Robledo**, [1]**Alvaro Ramírez**, [2]**Jimmy Flórez**, [2]**Sara Lourdy**, [2]**David Ortega** and [1,3]**Angela M. Rendón**

[1] *Geolimna, Escuela Ambiental, Facultad de Ingeniería, Universidad de Antioquia, Medellín, Colombia*
[2] *Centro de Desarrollo Tecnológico Aeroespacial - CETAD, Fuerza Aérea de Colombia, Rionegro, Colombia*
[3] *GIGA, Escuela Ambiental, Facultad de Ingeniería, Universidad de Antioquia, Medellín, Colombia*

contact: ksantiago.hernandez@udea.edu.co

Abstract

Numerical Weather Prediction models are an essential tool to advance our understanding of convective systems. Here we use the WRF model to investigate the atmospheric mechanisms behind the occurrence of convective systems in Northwestern South America. Our analyses are based on a cloud-resolving (4km) simulation between September and October 2019 and focus on six regions identified by previous studies as convection hotspots. We used a tracking and identification algorithm to assess the model performance against satellite data and select relevant convective systems based on their area, lifetime, and rainfall intensity. Dynamic and thermodynamic patterns in the atmospheric environment are studied in different stages of the convective events, and diurnal patterns during days with strong convection are investigated. Results reveal dynamics and thermodynamic mechanisms behind the genesis, evolution, and âĂŃâĂŃdecaying of convective systems, which vary with the region. First, in the Colombian Savannas and Amazon, convection evolution depends on diurnal heating patterns and dynamics in large-scale features such as low-level jets. Second, intra-valley differential heating and dynamics play a key role in convection in the Andean region. Third, in coastal regions, convective initiation and propagation relate to sea-land breezes and interaction with the inland topography.