

EGU24-5929, updated on 27 Mar 2025

<https://doi.org/10.5194/egusphere-egu24-5929>

EGU General Assembly 2024

© Author(s) 2025. This work is distributed under the Creative Commons Attribution 4.0 License.



Probing the Dynamics of Extreme Weather Events in the Azores, Portugal

Dhiman R. Mondal¹, Pedro Elosegui¹, Lucy Brock², Scott Paine³, Pedro Mateus⁴, and Virgilio Mendes⁴

¹Haystack Observatory, Massachusetts Institute of Technology, Westford, MA, USA

²Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA, USA

³Center for Astrophysics, Harvard & Smithsonian, Cambridge, MA, USA

⁴IDL/FCUL, University of Lisbon, Lisboa, Portugal

The rapidly changing climate is escalating the frequency and intensity of extreme weather events in the Azores, Portugal. It is crucial to comprehend the dynamics of these events to mitigate them. Atmospheric water vapor data from the Global Navigation Satellite System (GNSS) and reanalysis products from an atmospheric general circulation model can be utilized to investigate the dynamics of weather fronts in the Azores Islands. A primary goal of our study is to conduct a comprehensive comparison between GNSS and MERRA2-based atmospheric reanalysis data and derive small-scale atmospheric structures with high-temporal resolution. Using statistical analysis, we will unveil the similarities and discrepancies between the two approaches in capturing atmospheric water vapor patterns. Emphasizing an exploratory methodology, we will showcase our findings using a restricted dataset that centers on specific instances of extreme precipitation witnessed in the Azores Islands.