



Internal Structure of Giant Hail in a Catastrophic Event in Catalonia (NE Iberian Peninsula).

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During the last two years, Catalonia has experienced the most severe hail episodes of the previous three decades. The first one was on August 30th, 2022, and it affected the northeast of the country, resulting in significant urban damage, injuries, and one fatality—a two-year-old girl. The second episode impacted the region's southern part, causing extensive damage, particularly in urban areas. In both instances, giant hail was recorded, with a maximum diameter of 12 cm and 10 cm, respectively.

In response to these extraordinary episodes, we conducted exhaustive fieldwork in the core of the affected areas to understand the path and behavior of the thunderstorm over the terrain. Additionally, we collected hailstones preserved in the freezers by observers living in the affected village. In total, we have collected 20 samples during the first event and 12 samples in the second one.

We calculated most samples' sizes of the larger, mid, and minor axes, weight, and sphericity index. Furthermore, we underwent analysis through two methods. One of these methods involved employing an innovative technique in this field: Computed Tomography Scanning (CT scanning). This technique enables us to examine the internal structure of hailstones in three dimensions, thereby observing the diverse layers within them and their varying densities. Such analysis offers valuable insights into the processes these stones undergo within thunderstorms, which are influenced by temperature and humidity in various atmospheric layers. The second analysis involved a chemical analysis conducted in the laboratory, which unveiled a clear correlation between the main components and their proximity to the sea.