

Recovery of dust-sized extraterrestrial particles near Ellsworth Mountains, West Antarctica

DEEPAK BINU BEENA¹, STEVEN GODERIS¹, VERONICA TOLLENAAR², RAÚL R. CORDERO^{3,4}, FERNANDA CABELLO^{3,5}, FERNANDO INOSTROZA⁶, LISA KRÄMER RUGGIU¹, FIEN MARIE RAF JONCKHEERE¹, TRYGVE J. PRESTGARD¹ AND JULIUS PESOLA¹

¹Vrije Universiteit Brussel

²Department of Water and Climate, Vrije Universiteit Brussel, Brussels, Belgium

³Universidad de Santiago de Chile, Santiago, Chile

⁴University of Groningen, Wirdumerdijk 34, 8911 CE Leeuwarden, The Netherlands

⁵Physikalisch-Meteorologisches Observatorium Davos, World Radiation Center, PMOD/WRC, Davos, Switzerland

⁶Center for Antarctic Affairs of the Chilean Army

Extraterrestrial particles have been bombarding our planet from the time of its formation onwards. When small dust-sized extraterrestrial particles survive atmospheric entry, the residual micrometeorites can be used to constrain source regions and production mechanisms. Micrometeorites represent the largest fraction of the extraterrestrial flux to Earth, which is estimated to be about ~40,000 tons/year [1]. In recent years, micrometeorites have been recovered from a wide range of environments across the globe (e.g., Greenland ice, Atacama Desert soil, Antarctic sediments [2]). Here, we report a new collection of particles that have been recovered near Ellsworth Mountain, West Antarctica, and describe the physicochemical properties of this new collection. A first characterization of these particles is based on optical microscopy and along with it micro-XRF is used as a geochemical tool to differentiate particles. From these analyses, more than 200 particles have been identified as potential micrometeorites from 1.5 kg of sediments of < 2mm size, also the nickel, chromium, iridium and platinum concentrations were taken into consideration. Since there has been a presence of dust bands near the collection site [3], a ternary diagram is used to distinguish extraterrestrial particles from a volcanic origin (Figure 1). Further analysis of these particles relying on SEM-EDS, EMPA, and SIMS will confirm or not the extraterrestrial origin of the studied particles and aid in their textural classification.

References:

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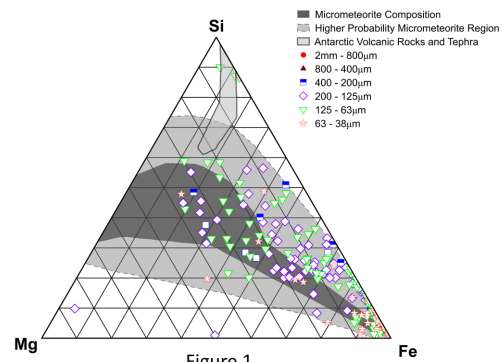


Figure 1