



Cosmic dust flux on Earth inferred from the Concordia micrometeorite collection

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The present extraterrestrial flux incoming to Earth is dominated by cosmic dust, i.e. micrometeorites in the 20-500 microns size range. Prior to atmospheric entry, the flux is estimated to $\sim 30\,000$ tons.yr⁻¹ [1]. The proportion of this flux reaching the earth surface as dust particles is debated [e.g. 2]. Since 2000, we recover micrometeorites from ultraclean snow in the vicinity of the Dome C Concordia station in Antarctica. This region has a well-characterized and small precipitation rate (~ 3.5 g of water per year) that allows collecting micrometeorites from large equivalent surfaces (> 100 m².yrs) by sampling reasonable volumes of snow. The high efficiency and cleanliness of the collecting process at Dome C has enabled the recovery of several thousands of particles larger than ~ 20 μ m, constituting the Concordia micrometeorite collection [3]. The Concordia micrometeorites have a young terrestrial age of about 50 years. We characterized more than three thousand micrometeorites (both melted and unmelted particles) by secondary electron microscopy and classified them in the textural types defined in [4]. A preliminary flux value of 6,000 tons.yr⁻¹ was given in [5] from the early Concordia collection examination. We now have better statistics to update this value.

References:

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