

A light scattering pathway for characterizing dust content in ice cores.

Llorenç Cremonesi (1), Claudia Ravasio (2), and Marco A. C. Potenza (2)

(1) DISAT, Università degli Studi di Milano-Bicocca

(2) Dipartimento di Fisica, Università degli Studi di Milano

The size distribution and light extinction of airborne particles provide valuable information for paleoclimate studies and radiative transfer models. We use non-invasive, single-particle light scattering techniques to characterize aeolian dust stored in glacial and alpine ice core samples, which provide direct access to the optical properties of dust without any free parameter. This allows to set constraints on morphological properties of dust such as shape, structure, and refractive index, reducing at minimum the need for coarse-grained models and approximations. Moreover, the particle-by-particle approach paves the way for comprehensive statistical analysis while overcoming limitations imposed by concentration.