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Composition of submicron-sized particles in the Saturnian system

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The population of Saturns outermost tenuous E-ring is known to be dominated by tiny water ice particles. Active volcanism on the moon Enceladus, embedded in the E-ring, has been known since late 2005 to be a major source of particles replenishing the ring. Thus, those particles are probes of the interior of the active moon and may provide crucial information about dynamical and chemical processes occuring below Enceladus' icy surface.
We present results of more than 5000 impact ionisation mass spectra of mostly E-ring particles, with sizes predominantly below 1 μm, detected by the Cosmic Dust Analyser onboard the Cassini spacecraft.
Three basic spectrum types implying three particle species can be identified in the Saturnian system: Pure water ice (Type I), water ice with significant impurities (Type II) and a minority of iron rich particles (Type III). We focus on the identification of non-water features in Type II and Type III spectra and present implications of our in situ measurements.