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An influence of salinity on icy dust grain charging

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The Cosmic-Dust-Analyzer onboard Cassini-Huygens investigates properties of dust grains in the Saturnian E-ring. Abundant icy dust grains are found up to the Titan orbit both embedded in the ring and forming fast dust streams. The grains are released in collisions of small bodies with Saturn icy moons or injected from Enceladus volcanoes. In the presence of strong magnetic and electric fields, their motion is driven mainly by the Lorentz force.

Having diverse salinity, icy dust grains accumulate different charges in the same surrounding plasma environment. Among dominant charging processes, the secondary emission varies significantly. We have applied our dust grain charging model to study the changes of the secondary emission yield of icy micron and submicron grains due to gradually increasing salt admixtures. The size and shape effects are also discussed.