



## **Radial variation in E-ring neutral cloud erosion**

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Ionization—whether through solar photons, impacting particles, or charge exchange—is a significant loss process in the E-ring neutral cloud. When these particles are ionized, they are energized by the electric field associated with the corotating magnetized plasma. When the pick-up energy is great enough, the particles generate ion cyclotron waves with a magnetic field amplitude that is determined by the energy of the pick-up ions. These waves, with frequencies near the local water-group gyrofrequencies, were first seen in the E ring by the Pioneer 11 and Voyager 1 magnetometers, but Cassini's large coverage of radial distance, local time, and latitude within the E ring allows us to use this spacecraft's magnetometer to conduct a more comprehensive study of these waves. We use these measurements to probe the erosion rates by assuming a simple model of the plasma cloud. We present here these rates, focusing on their variation with radial distance from Saturn and enhancements in strength at the orbits of the icy moons.