



The plume variation at Enceladus

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It has been nine years since the discovery of the Enceladus plume, while its variation within this time is still under debate. A recent study has proposed that the vent intensity depends on the moon-Saturn distance. In our study we use a different data set to investigate this variation, and also check its co-relationship with other orbital characters.

Between 2005 and 2012, Cassini has made 20 close flybys around Enceladus. Its plasma instrument has recorded the ambient magnetospheric plasma density, while its magnetometers have recorded the change in magnetic field by particle pickup. Unlike particle detectors that measure the in situ density along the path, or imagers that measure the vent temperature, the magnetometer measures the magnetic field, which provides the total momentum exchange in the whole interaction region. We use the magnetometer data and ambient plasma data along these 20 flybys, assisted with our MHD model, to determine the time variation of the total plume ejecta during these 8 years.