

GALILEO'S ENCOUNTER WITH AMALTHEA

T. V. Johnson (1) and J. D. Anderson (1)

(1) Jet Propulsion Laboratory, Caltech, Pasadena, CA USA
(Torrence.V.Johnson@jpl.nasa.gov)

Galileo's last science periapsis encounter with Jupiter before impact was on orbit 34. One of the main scientific goals of this encounter was a close, targeted flyby of the satellite Amalthea. Although two-way Doppler tracking was lost near closest approach, one-way data were obtained throughout the encounter. Together with solid two-way data before and after the encounter period, there is enough information to constrain the mass of the satellite. Together with previously determined shape and volume information these data yield a useful value for the density of this highly non-spherical moon. Preliminary analyses have been presented indicating a bulk density near 1 gm/cc, considerably lower than was expected from the satellite's dark albedo and anticipated rocky composition. Low-density rock or rock/ice mixtures combined with a high porosity, similar to that inferred from recent small asteroid data, are suggested as the most likely explanation. Refined estimates of mass and density as well as uncertainties will be presented and the implications for Amalthea's composition and porosity discussed.