



## The gravity field of Rhea

R. Mackenzie (1), L. Iess (2), N. Rappaport (3), P. Tortora (4)

(1) ESA-ESOC, Darmstadt, Germany, (2) Universita' La Sapienza, Rome, Italy, (3) Jet Propulsion Laboratory, Pasadena, CA, USA, (4) Universita' di Bologna, sede di Forli', Italy

On 26 November 2005 the Cassini spacecraft encountered the Saturnian satellite Rhea in a flyby devoted to gravity science. Radiometric data acquired at and around closest approach yields the mass of Rhea and the quadrupole moments of its gravity field. The data may be analyzed using different geophysical assumptions, in particular about hydrostatic equilibrium, leading to different values of  $J_2$  and  $C_{22}$  and to different interpretations of the internal structure. After a review of previous analyses, we present our best, unbiased estimates of the gravity field parameters, based upon the use of accurate tracking and calibration data (Ka-band Doppler observables and advanced water vapour radiometer for tropospheric path delay compensation). In the case of a gravity field limited to second degree harmonics, the most reliable solution is non-hydrostatic, with a ratio  $J_2/C_{22} = 3.93$ .