

Comparison of Shape Models for 433 Eros using Imaging and Altimetry

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The NEAR mission produced shape models of asteroid 433 Eros by both the imaging team and the altimetry team. Preliminary models by both teams at the 2 degree x 2 degree resolution, equivalent to about 250 meter block size, have been compared. The purpose of the comparison was to understand the strengths of the two approaches and to judge how well we have determined the shape of 433 Eros. A comparison of these models shows that they differ by varying amounts at all scales. The difference between the two estimates of the mean radius of Eros expressed as the degree zero term in a spherical harmonic expansion is 18 meters where the imaging value is the larger. In addition, there is a difference of about 25 meters in the location of the center of figure that creates a slope from the south to the north of 50 meters that dominates the long wavelength difference between these two models. After removal of this south-to-north trend the rms difference between the two 2x2 degree models is about 40 meters. At the short wavelengths (~1km) there is more power in the altimetry solution than the imaging solution and this is apparent from a comparison of synthetic profiles across the asteroid, derived from the models.