Surface reflectance analysis of asteroid (21) Lutetia

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The disk-integrated and disk-resolved surface reflectance of asteroid Lutetia has been analyzed using multi-band, visible-wavelength images obtained by OSIRIS (Optical, Spectroscopic, and Infrared Remote Imaging System) onboard the European Space Agency's Rosetta spacecraft during a close flyby in July 2010 [1]. The series of whole- disk images covering phase angles between 0.1 deg to 140 deg let us to construct the phase curve. The Hapke disk-integrated model of bidirectional reflectance can be fitted to the phase curve, and the Hapke parameters, including single-scattering albedo and macroscopic roughness can be retrieved [2]. The phase curve of Lutetia has a suitable coverage of small phase angles to investigate the opposition effect, as well as large phase angles to examine the double-term Henyey-Greenstein function as the single-scattering phase function. Besides, OSIRIS images in different filters are valuable to describe the wavelength variation of single-cattering albedo. The OSIRIS disk-resolved images allow us to apply Hapke modeling to the surface of the asteroid through the bidirectional reflectance I/F by means of high-resolution shape model of Lutetia [3]. Lutetia's surface shows evidence of large photometric variations, and has to be partitioned into sub-regions to acquire Hapke parameters for each terrain individually. We will present results of reflectance modelling of asteroid (21) Lutetia.

References: [1] Sierks H. et al. (2011) Science 334, 487–490. [2] J.-Y. Li et al. (2007 a) Icarus, 187 (2007), pp. 41–55. [3] Jorda L. et al. (2011) Vol. 6 EPSC-DPS2011-776.