Mapping of visible images of an asteroid on its shape model: GIS-oriented analysis

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We develop a procedure to mapping image data of Itokawa taken by Hayabusa onto the shape model of Itokawa. As accurate navigation data of Haybusa is used in this procedure, parameters of a photometric function (incidence angles, emission angles, and phase angles) for all local places on the asteroid are estimated simultaneously. All data are stored in the database. Once radiometric calibration of camera data is finished, albedos and photometric functions on every local places on Itokawa can be estimated.

We also develop a GIS-oritentaed tool to analyze a model of irregular-shaped small body and various properties mapped on its surface. Many maps such a s gravity/slope maps, a near-infrared reflectance map are displayed on the shape model in a multi-layer style with this tool. Researchers can investigate relationships among various surface properties represent those maps. The albedo map that is mentioned above is one of the important data of this tool.