

Results from New Recent Photogrammetric Analysis of Ganymede Images

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Introduction: While Ganymede has been observed frequently by spacecraft, including Pioneer, Voyager, Galileo, Cassini, and New Horizons, only data from Galileo and the two Voyager`s are useful for precise map-ping. We have recomputed the Ganymede control point network to support spacecraft navigation and coordinate knowledge in future proposed Ganymede lander missions. We benefit from new orbital models for the Galileo spacecraft, currently available. Our network is currently based on 102 images (Voyager: 94; Galileo 8) and has and 420 control points. Based on the control net, we have produced regional and global image mosaics and maps. Coverage for Ganymede is nearly complete except for polar areas (which includes multispectral data). However, large differences exist in data resolutions (minimum global resolution: 30 km/pixel). Only few selected areas enjoy coverage by highest resolution images. Results of our preliminary study will be reported at the meeting. In future we expect to increase the accuracy of our control point network and map using updated pointing information for Galileo instrument (B. Semenov, JPL, pers. communication). Based on the new control point network we suggest to obtain Digital Elevation Models (DEMs) [2] from stereo images for selected areas, new estimations for the figure parameters of the satellite, as well as measurements of Ganymede`s rotational axis orientation and librations. Our map will also be an important tool for studies of surface geology and morphology. We will also extend our work to include the outermost Galilean satellite Callisto.

References: [1] Nadezhdina I., Zubarev A., Zharov A., Zharov O., Nikitina A., Rubtsova N (2012) Creating of new global control point networks of Io and Enceladus; [2] Nadezhdina I., Patraty V., Shishkina L., Zubarev A., Zhukov D., Karachevtseva I., Oberst J. (2012) Global shape estimates and GIS cartography of Io and Enceladus using new control point network.



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