Ganymede's stratigraphy and crater distributions in Voyager and Galileo SSI images: results from the anti-jovian hemisphere

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Crater size distributions are a valuable tool in planetary stratigraphy to derive the sequence of geologic events. In this study, we extend our previous work [1] in Ganymede's sub-jovian hemisphere to the anti-jovian hemisphere. For geologic mapping, the map by [2] is used as a reference. Our study provides groundwork for the upcoming imaging by the JANUS camera aboard ESA's JUICE mission [3]. Voyager-2 images are reprocessed using a map scale of 700 m/pxl achieved for parts of the anti-jovian hemisphere. To obtain relative ages from crater frequencies, we apply an updated crater scaling law for cratering into icy targets in order to derive a crater production function for Ganymede [1]. Also, we adopt the Poisson timing analysis method discussed and implemented recently [4] to obtain relative (and absolute model) ages. Results are compared to those from the sub-jovian hemisphere [1] as well as to support and/or refine the global stratigraphic system by [2]. Further emphasis is placed on local target areas in the anti-jovian hemisphere imaged by Galileo SSI at regional map scales of 100 to 300 m/pxl in order to study local geologic effects and processes. These areas incorporate (1) dark and (2) light tectonized materials, and (3) impact crater materials including an area with numerous secondaries from ray crater Osiris. References: [1] Wagner R. et al. (2014), DPS meeting #46, abstract 418.09. [2] Collins G. et al. (2013), U.S.G.S. Sci. Inv. Map 3237. [3] Della Corte V. et al. (2014), Proc. SPIE 9143, doi:10.1117/12.2056353. [4] Michael G. et al. (2016), Icarus 277, 279-285.