

Europa Surface Geology: Expanded Stratigraphic Unit Descriptions Derived from Collaborative Analysis of Galileo NIMS and SSI Observations from E14

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During Galileo's 14th orbital encounter, both the camera system (SSI) and the Near-Infrared Mapping Spectrometer (NIMS) imaged the "wedges" region near 180 W, 30 S. The average resolution of the SSI images was 233 m/pixel, while that for NIMS was about 1.5 km/pixel.

Geologic mapping of the area imaged by SSI was performed by Prockter et al. (JGR 104, 16531, 1999). They identified 15 stratigraphic units, on the basis of morphological and relative albedo differences. These include 3 types of chaos, 3 types of lenticulae, double and complex ridges, 4 categories of bands, ridged plains, craters, and a low albedo plains unit that may be genetically related to either the chaos or lenticulae. Most of these units are well-resolved in the NIMS observation. The availability of these high-quality, overlapping data sets permits us to derive unit-by-unit composition and grain size information to supplement the current unit descriptions of the stratigraphic column. Improved unit descriptions are likely to provide new constraints for distinguishing between competing models of terrain formation processes, and may shed light on questions of aging effects (the evolution of microphysical properties of the surface with time).