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Abstract 51144

BAND DISTORTIONS AND MINOR COMPONENTS IN THE SPECTRA OF JUPITER'S ICY GALILEAN SATELLITES.

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In Session 125 Planetary (Posters) Wednesday, 28-Oct-98 PM in Room: Hall-E at 1:30 PM for 240 minutes.

Abstract: Data obtained both from earth-based observations and from the Galileo Near-Infrared Mapping Spectrometer (NIMS) have shown that Jupiter's icy Galilean satellites (Europa, Ganymede, and Callisto) have infrared spectra which closely resemble water spectra. The satellite spectra, however, exhibit some bands which are distorted, some which have apparent shifts in band centers, and some bands which are clearly due to non-water ice components such as CO₂.

There are at least two models for the modification of band shape, a scattering model and a bound-water model. The former attributes the distortions to a complex layered surface with the different layers having significantly different particle sizes and hence differing absorption path lengths. The latter model attributes the distortions of spectral shape to the (tightly) bound water of hydration of salts typically found in evaporites.

Understanding the mechanism leading to band distortion is important to enable removing the dominant spectral signature which may be masking small absorptions by minor components of the surface. It is also necessary for resolving the issue of whether the ice on Europa has significant salt content - a possible line of evidence for oceans on Europa.

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