

Abstract Information

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**Abstract Body Preview**

The Galileo spacecraft has been orbiting Jupiter since 1995. During that time it has provided several opportunities for the study of the plasma environments of the icy Galilean satellites Europa, Ganymede, and Callisto by means of radio occultation of its S-band (13.5 cm. Wavelength) signal. There have been five occultations each by Europa, Ganymede, and Callisto, however, one of the Ganymede and one of the Callisto occultations occurred near superior conjunction, and did not provide useful data.

Analysis of these data revealed small excursions in frequency (of the order of 0.01 Hz, or about 4 parts in  $10^{12}$ ), which indicated the presence of tenuous plasma above the surfaces of these bodies. When observed, the maximum electron densities range from about 5 to about  $20 \times 10^3 \text{ cm}^{-3}$ . The apparent vertical structure of these plasma layers range from classical ionospheric profiles observed at Callisto on two occasions to multi-peaked structures observed at Europa. On several occasions no discernible plasma was observed.

These observations could be explained by a process in which a tenuous neutral atmosphere ( about  $10^{10} \text{ cm}$  is created on the trailing hemisphere by sputtering from the icy surface by energetic particles of the Jovian magnetosphere. If the trailing hemisphere is also illuminated by the Sun, plasma is produced by photoionization and is observed by radio occultation. The configuration of this plasma is, however, determined by its interaction with the corotating Jovian magnetospheric plasma, which under certain geometries would lead to the observation of multip peaked structures.

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