

IONOSPHERES OF THE GALILEAN SATELLITES OF JUPITER FROM GALILEO RADIO OCCULTATIONS A.J. Kliore, A. Anabtawi (Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, USA), and A.F. Nagy (University of Michigan, Ann Arbor, MI 48109, USA)

The Galileo orbiter spacecraft has been carrying out a "tour" of the Jovian system, during the course of which it has provided radio occultations by all of the Galilean satellites of Jupiter. By the end of the Galileo Extended Mission (GEM) in January of 2000, Io (J1) will have occulted the spacecraft six times, Europa (J2) four times, Ganymede (J3) four times, and Callisto (J4) also four times. The occultations of Europa in December, 1996, have produced evidence of a tenuous ionosphere, with a maximum electron density near the surface of about 10^4 cm^{-3} and a plasma scale height of about 200-300 km. (Kliore, et al., *Science*, **277**, 1997). If the neutral atmosphere consists of H_2O or O_2 , this implies a maximum neutral density of about 10^8 cm^{-3} near the surface. The occultations of Ganymede have produced results that make a detection of an ionosphere difficult. Any Ganymede ionosphere would have a maximum density near the surface of less than 10^3 cm^{-3} , possibly indicating a shielding effect of Ganymede's magnetosphere. The four occultations of Callisto have produced a probable detection of an ionosphere having a maximum density of about $5 \times 10^3 \text{ cm}^{-3}$, probably produced by sputtering of the icy surface by Jupiter's magnetosphere, as in the case of Europa. The research described in this paper has been conducted at the Jet Propulsion Laboratory and the University of Michigan with support from NASA contracts and grants.

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