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Europa's Interaction With Jupiter's Magnetosphere: The Wake Region

M. Volwerk(1,2), C. Paranicas(3), M.G. Kivelson(4,5) and K.K. Khurana(4)

((1) Space Research Institute, Austrian Academy of Sciences, A8042 Graz, Austria (martin.volwerk@oeaw.ac.at), (2) Max Planck Institute for Extraterrestrial Physics, Garching, Germany, (3) The John Hopkins University Applied Physics Laboratory, Maryland, USA, (4) Institute for Geophysics and Planetary Physics, UCLA, USA, (5) Department of Earth and Space Sciences, UCLA, USA

In its several years of operation, the Galileo spacecraft has encountered Jupiter's satellite Europa several times. The multiple close passes have illuminated some aspects of the interaction of the moon with the magnetized plasma that continually overtakes it in its orbit. In this presentation we will discuss the three downstream wake passes of Galileo (E4, E11 and E15, where we will combine the magnetometer (MAG) and energetic particle (EPD) data. Our intent is to get an estimate of the size of the interaction region, where it is expected that the flow diversion around the moon will decrease the size of the interacting fluxtube to less then 2 Europa radii. We will discuss the signatures of ion pickup, shown by magnetic field bendback and ion losses, shown by a decrease in particle counts. Our initial estimate is that 10% of the flow is diverted around the moon. The signatures are mostly asymmetric with respect to the center of the wake. This cannot be explained by the trajectory of the spacecraft, but has to be inherent to the processes taking place near the moon.