

ABSTRACT FOR EGS 2000. COVENER: K. SAUER

MGS Observations of the Solar Wind Interaction With Mars

D Winterhalter(1), C Mazelle (2) , D Mitchell(3), M H Acuna(4), and J E P Connerney(4)

(1)Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109;

(2)Centre d'Etude Spatiale des Rayonnements, Toulouse, France;

(3)Space Science Laboratory, University of California, Berkeley, CA 94720;

(4)NASA Goddard Space Flight Center, Greenbelt, MD 20771;

From March 1998 to September 1998 the Mars Global Observer spacecraft orbited Mars in the elliptical "Science Phasing Orbits" (SPO), collecting definitive measurements of the planet's interaction with the solar wind. The spacecraft traversed Mars' bow shock and the pile-up boundary locations twice each orbit, for 292 orbits, at slowly changing local times as the orbit plane evolved from near the dawn-dusk meridian past the noon-midnight meridian.

A preliminary analysis of the MGS data shows that, as seen in previous studies, the positions of the boundaries (normalized with solar wind pressure) is highly variable, and that the average shock surface deviates from the average shape determined from previous Mars data. It is probable that the positions and shapes of the boundaries are modified by (some of) the highly localized magnetic anomalies discovered by MGS. The variability from orbit to orbit of the positions and shapes might be the consequence of the anomalies, fixed on the rotating planet, appearing and disappearing as viewed from the solar wind direction. We will report on our investigation of the solar wind/Mars boundaries and on their dependence on the near surface magnetic anomalies.