

## Early History of the Interplanetary Magnetic Field: Pioneer and Mariner Observations

E.J. Smith (Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Mail Stop 169-506, Pasadena, CA 91109; 818-354-2248)

Many of the early observations of the interplanetary magnetic field in the 1960's and early 1970's were carried out by a group of collaborators from the west coast (Paul Coleman, Leverett Davis, Chuck Sonett and myself). The first extended interplanetary measurements were obtained with a two-axis magnetometer on the interplanetary probe, Pioneer V, and by a three-axis fluxgate magnetometer on Mariner 2 while enroute to a successful encounter with Venus in 1962. These missions were followed by Mariner 4, which traveled outward to 1.4 AU and arrived at Mars in 1965 carrying a vector helium magnetometer. The same team obtained further interplanetary field measurements inside 1 AU with Mariner 5 which was sent to Venus in 1967. Measurements beyond 1.4 AU and at heliographic latitudes exceeding 15° were obtained by Pioneers 10 and 11 enroute to Jupiter and Saturn. Each of these missions gradually advanced our knowledge, and overcame our ignorance, of the IMF and provoked a series of scientific controversies and questions. Topics of special significance were the variable field strength, the possible persistence of a north-south component, the existence and variability of the Parker Spiral, interplanetary shocks, waves and discontinuities, the relation between the field and solar wind structure and the sector structure and heliospheric current sheet. The major contributions of the above missions to these topics will be discussed chronologically and within their historical context.

1. 1993 Spring Meeting
2. 001222040
3. (a) E.J. Smith  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
M/S 169-506  
Pasadena, CA 91109  
  
(b) Tel: 818-354-2248  
  
(c) fax: 818-354-8895
4. SI1
5. (a) SI104 - History of the Solar Wind  
(b) 2134,2139,2149
6. N/A
7. 0%
8. Charge \$50 to VISA  
4798-2640-002.0-0956  
Exp. 7/95
9. I (Cliver)
10. N/A
11. No