A Case Study of Post-CME Flow

R. Goldstein and M. M. Neugebauer (both at Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109; e-mail: rgoldstein@jplsp.jpl.nasa.gov; mneugeb@jplsp.jpl.nasa.gov)

Most studies of the interplanetary manifestations of coronal mass ejections (CMEs) have focused on the shock driver gas or on the regions which display a flux-rope magnetic topology. Somewhat less attention has been paid to post-CME flows to determine how the solar wind returns to its ambient, pre-CME condition. A CME observed by ISEE-3 and other spacecraft during the period September 29- October 3, 1978 exhibited some interesting features which we will describe. Many of the plasma parameters typically associated with CME flow, such a low temperatures, low beta, and high helium abundance, extended for several days after the disappearance of the magnetic cloud geometry and the bidirectional streaming of superthermal electrons and energetic protons. During the last two subintervals of high helium abundance, there were large fluxes of outwardly propagating Alfvén waves and differential streaming between protons and alpha particles, both suggestive of transient coronal-hole flow in the region in which the interplanetary field lines have already been reconnected to their quasi-stationary configuration. The results of a statistical survey of the post- CME flow of events during the 1978 to 1980 period will also be described.

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3. a) R. Goldstein
Jet l'repulsion Laboratory
MS 169-506
4800 Oak Grove Drive
Pasadena, CA 91109

b) Tel. 818354-0241
c) Fax 818354-8895
d) email: rgoldstein@jplsp.jpl .nasa.gov
or JPLSP: :RGOLDSTEIN

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