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Multi-spacecraft observations of interplanetary shock parameters

Andriy Koval (1) and Adam Szabo (2)
(1) GEST/UMBC, NASA/GSFC (andriy.koval@nasa.gov), (2) NASA/GSFC

We are presenting a study of interplanetary shock parameters (orientation, propagation speed, Mach number, and θ_{Bn}, the angle between the shock normal and magnetic field) observed by multiple spacecraft in the solar wind. These parameters are calculated locally from the magnetic field and plasma (proton and alpha-particle) measurements of the Wind and ACE spacecraft by applying the modified *Koval and Szabo* [2008] technique that uses the anisotropic Rankine-Hugoniot conservation equations. The calculated local shock orientations and speeds are consequently used to predict the times of the shock arrival to the locations of the other spacecraft available in the solar wind assuming shock planarity and constant speed. We compare the predicted times with those observed as well as directly compare the Wind and ACE local shock normals and speeds with each other and with the global shock normal and speed determined from the four-spacecraft times and locations of the shock passages (when available). The agreement of the shock's shape with the planar assumption is discussed based on the shock Mach number, θ_{Bn} angle, and the shock driver. We also discuss the discrepancy of the other shock local parameters as a function of the inter-spacecraft separation.