

Solar related interplanetary shocks recorded at L1 during Solar Cycle 23 and their characteristics

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During the maximum phase of Solar Cycle 23, some 207 flare related shocks were identified to exit the Sun on the basis of their association with metric Type II drift bursts. Signatures of these shocks were sought in plasma (SWEPAM) and magnetic (MAG) data recorded aboard the ACE spacecraft at L1. Real time, predicted, shock arrival times estimated using the Shock Time of Arrival Model (STOA), the Interplanetary Shock Propagation Model (ISPM) and the modified Hakamada-Akasofu-Fry Solar Wind Model (HAFv.2) were compared with the observed shock arrival times. The correspondences observed were graded following statistical methods commonly used in meteorology. A figure of merit is, herein, defined to describe the success rate of the predictions relative to the measurements. This provides a reference metric for the maximum years of Solar Cycle 23. The figure of merit obtained is compared with a corresponding value estimated with respect to 173 complementary events previously analyzed in the same way and recorded during the rise phase of Solar Cycle 23. Combining the two samples provides information on the statistical success of the models in relation to 380 events, the largest test-sample hitherto considered.