

Space Weather Analysis and Novel Browser-based Tools

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Abstract

We will present time series analysis of solar, solar wind and magnetospheric space weather measurements. Phenomena in time scales from seconds to solar cycles will be covered. We compare occurrence rate and strength of the most geo-effective solar wind structures such as high-speed streams (HSS), interplanetary shocks (IS) and coronal mass ejections (ICME). Detailed analysis of the source region for the geo-effective solar wind structures as well as their magnetospheric effects will be presented. We found out that the occurrence rate of the strongest geomagnetic events (storms and substorms) maximizes during the declining solar cycle phase, which is most strongly driven by high-speed streams originating from the solar coronal holes. A novel browser-based analysis tool called Substorm Zoo (www.substormzoo.org) will be presented and an example space weather event will be shown. On November 6, 2001, two GEO satellites measured high s/c charging values at the time when very high velocity HSS together with ICME hit the Earth. We will use Substorm Zoo (1) to present space weather data in different parts of the heliosphere, (2) to analyze the space weather event, (3) to compare with the long-term space weather statistics and (4) to discuss about the space weather effects of the disturbance