

NEW SUBSTORM INDEX, Wp INDEX, DERIVED FROM HIGH-RESOLUTION GEOMAGNETIC FIELD DATA AT LOW LATITUDE AND ITS COMPARISON WITH AE AND ASY INDICES

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High-resolution geomagnetic field data (i.e., ≤ 5 seconds) have recently become more commonly used by space physicists. The data permit the identification of Pi2 pulsations, having periods of 40-150 seconds and irregular waveforms. Pulsations of this type appear clearly in time series from mid- and low-latitude ground stations on the nightside at substorm onset. Therefore, with data from multiple observatories, substorm genesis and evolution can be monitored. Here we propose a new substorm index, the Wp index (Wave and planetary), which measures Pi2 spectral power at low-latitude. This index is derived from geomagnetic field data obtained from observatories arranged in longitude around the Earth's circumference. Presently, data from 8 ground stations (Kakioka, Urumqi, Iznik, Fürstenfeldbruck, San Juan, Teoloyucan, Tucson, and Honolulu) are used, but future work will include data from other sites as well (Tristan da Cunha and Ebro). Here we compare substorm occurrence estimated from the Wp index and those from the AE and ASY indices. We show that the Wp index is a good indicator of substorm onset. The Wp index, other substorm indices, and geosynchronous satellite data are plotted in a stack and are made available from the web site (<http://s-cubed.info>) for public use.

Substorm, Pi2 pulsation, Global observation

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