

New substorm index derived from high-resolution geomagnetic field data at low latitude and its comparison with real-time AE index

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Geomagnetic field data with high time resolution (i.e., 1 second) become more popular recently. Using such high time resolution data, we can identify Pi2 pulsations which have a period of 40-150 s and an irregular waveform. It is generally accepted that Pi2 pulsations appear clearly in mid- or low-latitude ground station on the nightside in close connection with substorm onsets. Thus we can monitor substorm activity at any given time if we examine Pi2 activity at multiple geomagnetic observatories which distribute globally with longitudinal separation of about 120 degrees or less. Here we propose a new index reflecting Pi2 wave power at low- and mid-latitude. This index is derived by wavelet analysis for geomagnetic field data obtained at different longitudinal sectors. Possible observatories are Kakioka, Urumqi, Iznik, Fuerstenfeldbruck, Ebro, Tristan da Cunha, Teoloyucan. We will make a comparison of substorm activity estimated from this new index and those from the AE or other substorm indices.

Location of observatories in geomagnetic coordinates

