

SPATIAL AND TEMPORAL STRUCTURES IN P13 PULSATIONS USING SINGULAR SPECTRUM ANALYSIS: A CASE STUDY

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Ground based magnetic data in conjecture with geostationary satellite measurements as well as interplanetary conditions have been analyzed in order to decipher fine structures in substorm associated P13 pulsations using singular spectrum analysis (SSA). The report demonstrates that SSA is a powerful technique to perform such studies. The study reveals oscillations of frequencies 0.7, 1.6, 2.1 and 3.0 mHz at many of the ground stations and geosynchronous altitude, although the appearance may differ in different latitudinal and longitudinal sectors. The structures of different frequencies are more regular and systematic at low and mid latitudes as compared to auroral and high latitude regions. The onset of substorm at high latitude stations lags behind the onset at auroral zone as revealed in the raw data of closely spaced IMAGE chain stations falling in the evening sector. Similar lag was envisaged and truly found in the statistically significant oscillations embedded in the substorm associated P13 event. The oscillations of various P13 linked frequencies expectedly show significant equatorial enhancement in the noon sector.

P13 pulsations, singular spectrum analysis, substorm

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