Low Latitude Magnetic Field Response to Sudden Changes in the Solar Wind Pressure Front and Interplanetary Magnetic Field Orientation

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Dynamic sun continuously emits electromagnetic and particle radiations with highly variable performance characteristics. Solar flares and Coronal Mass Ejections are basic outbursts arising from the instabilities in the magnetic field of the sun. Shock wave disturbances in the solar wind, energetic particle events in interplanetary space and large geomagnetic storms are found to occur in association with the emissions from the sun. Near instantaneous response of the earth's magnetosphere to large increase in the solar wind dynamic pressure is the compression on the dayside magnetopause which continues to extend to the tailside. The present study mainly focuses on the response of the ground magnetic field variations seen at the equatorial and low latitudes to a series of continuous solar wind pressure variations. During the main phase of geomagnetic storms, large perturbations in and around the auroral regions following the oscillatory pattern of interplanetary magnetic field also contribute towards driving intense magnetospheric activity. Close correspondence observed between the compressional oscillations of energetic particle flux data at geosynchronous locations and ground magnetic field variations at equatorial and low latitudes are discussed. An attempt is also made to examine and interpret the global response for some of the storm-time disturbances.