



Are Pi2 pulsations in meridian plane a field line dipolarization?

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Dawn-dusk flow shears in the nightside magnetosphere associated with field line dipolarization produce tangential discontinuities in the midnight sector and generate periodic displacement of the discontinuity surface at Pi2 periodicities through the KH instabilities [Saka et al., 2010].

Wave polarizations of Pi2 pulsations thus produced in the magnetosphere by the boundary displacement are generally reversed in the polar ionosphere [Saka et al., 2012]. The polarization reversal cannot be understood through the reconfiguration of geomagnetic field lines in terms of the fundamental harmonics but rather by considering the third harmonics in the meridian planes. On the ground, negative bays marked by decrease of the northward component of the geomagnetic fields are observed. We show that the field line deformations associated with third harmonics matched those of field line dipolarization and they are produced by the poloidal wave mode guided along the field lines: guided poloidal mode [Radoski, 1967]. This result indicates that Pi2 pulsations in meridian plane are field line dipolarization itself excited at the outer boundary of closed magnetosphere.

References

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