Application of a global magnetospheric-ionospheric current model for dayside and terminator Pi2 pulsations

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Pi2 magnetic oscillations on the dayside are considered to be produced by the ionospheric current that is driven by Pi2-associated electric fields from the high-latitude region, but this idea has not been quantitatively tested. The present study numerically tested the magnetospheric-ionospheric current system for Pi2 consisting of field-aligned currents (FACs) localized in the nightside auroral region, the perpendicular magnetospheric current flowing in the azimuthal direction, and horizontal ionospheric currents driven by the FACs. We calculated the spatial distribution of the ground magnetic field produced by these currents using the Biot-Savart law in a stationary state. The calculated magnetic field reproduced the observational features reported by previous studies; (1) the sense of the H component does not change a wide range of local time sectors at low latitudes; (2) the amplitude of the *H* component on the dayside is enhanced at the equator; (3) The *D* component reverses its phase near the dawn and dusk terminators; (4) the meridian of the *H*-component phase reversal near the dusk terminator is shifted more sunward than that near the dawn terminator; (5) the amplitude of the *D* component in the morning is larger than that in the early evening. We also derived the global distributions of observed equivalent currents for two Pi2 events. The spatial patterns of dayside equivalent currents were similar to the spatial pattern of numerically derived equivalent currents. The results indicate that the oscillation of the magnetospheric-ionospheric current system is a plausible explanation of Pi2s on the dayside and near the terminator. These results are included in an accepted paper by Imajo et al. [2017, JGR].