低緯度朝側昼夜境界付近で観測されるPi2型地磁気脈動と湾型磁場変動

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Pi2 pulsation and magnetic bay in low latitudes observed around the dawn terminator

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We examined Pi2 pulsations and magnetic bay observed simultaneously at low-latitude stations around the dawn terminator. We obtained the following results about Pi2 pulsations around dawn terminator [Imajo et al, 2015, JGR]:

(1) In the sunlit region, Pi2 oscillations tend to be polarized in the D (positive eastward) direction. (2) The D component oscillations in the dark and sunlit regions are in antiphase, whereas the H (positive northward) component oscillates in phase. (3) The D component oscillations in the sunlit Northern and Southern Hemispheres are in antiphase. (4) A statistical analysis indicates that these D component phase reversals occur about 0.5 hour sunward of the dawn terminator at 100 km in altitude, corresponding to the highly conducting E layer.

These results indicate that D component Pi2s in the dawn sector are controlled by the longitudinal gradient of ionospheric conductivities at the dawn terminator. We also investigated D component magnetic bays accompanied with Pi2 around the dawn terminator. We found both cases that the sense of the D component bay was reversed / not reversed with respect to the dawn terminator when the phase of D component Pi2 was reversed. This suggests that the sunrise effect on the Pi2 pulsation and the magnetic bay are not always same.

Reference: Imajo, S., et al. (2015), Pi2 pulsations observed around the dawn terminator, J. Geophys. Res. Space Physics, 120, 2088-8211;2098, doi:10.1002/2013JA019691.