Latitudinal and longitudinal dependence of the time delay of PRI

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It is found that the amplitude peak of PRI is observed almost simultaneously at the middle latitude and equator, when the PRI/DL amplitude ratio is less than 0.2. On the other hand, a PRI peak observed at high latitudes (L=5.4~8.5) often shows a longitudinal time delay of a few tens of seconds, even if the PRI/DL amplitude ratio at mid-latitudes is less than 0.2 for the event. Present results indicate that the apparent time delay of PRI amplitude peak at high latitude may be produced by the different causes from that at middle latitude.

In previous presentation, we showed that the time delay from the PRI onset to its (negative) peak is linearly dependent on the ratio of the peak amplitude of the PRI to the amplitude of the following step-like variation (DL-field).

Because the ratio is latitude-dependent, the apparent latitude dependence of the peak time delay does not necessarily indicate the actual latitudinal propagation of PRI.

In this paper, we have examined the relationship between the amplitude ratio of PRI/DL and the peak time delay of PRI in more detail, by using the 210 MM magnetometer network data.

As a result, it is found that the amplitude peak of PRI is observed almost simultaneously at the middle latitude and equator, when the PRI/DL amplitude ratio is less than 0.2. On the other hand, a PRI peak observed at high latitudes (L=5.4~8.5) often shows a longitudinal time delay of a few tens of seconds, even if the PRI/DL amplitude ratio at mid-latitudes is less than 0.2 for the event. Present results indicate that the apparent time delay of PRI amplitude peak at high latitude may be produced by the different causes from that at middle latitude.