

# Magnetic Field Oscillations Observed by Swarm Satellites in the Nightside Upper Ionosphere During Low-latitude Pi2 Pulsations

\*Khan-Hyuk Kim<sup>1</sup>, Jae-Hee Park<sup>1</sup>

1. School of Space Research, Kyung Hee Univ.

Pi2-associated geomagnetic oscillations in the nightside upper ionosphere are studied using magnetic field data acquired by low-Earth orbiting multispacecraft Swarm and at the low-latitude Bohyun (BOH) station located at magnetic shell of  $L = 1.3$  on 22 October 2014. Four Pi2 events were identified from the BOH data near midnight (MLT = 1.5) while Swarm A, B, and C spacecraft were orbiting on the nightside (MLT = 21-22) upper ionosphere from  $70^\circ$  to  $-60^\circ$  in magnetic latitude (MLAT) at 450-500 km altitudes. It is found that the horizontal H component of BOH data is well correlated with the radial ( $B_x$ ) and compressional ( $B_z$ ) components of ionospheric magnetic fields when Swarm spacecraft were at  $|\text{MLAT}| < 30^\circ$ . Both  $B_x$  and  $B_z$  components exhibit in phase or out of phase with the BOH H oscillations depending on the location of the spacecraft (i.e., in the Northern Hemisphere or in the Southern Hemisphere). This indicates that Pi2-associated magnetic oscillation in the ionosphere is the consequence of field line displacement that is symmetric or odd mode about the magnetic equator. We also find that stationary magnetic field perturbation, which is similar to Pi2 oscillation but not associated Pi2 signals, in the upper ionosphere near magnetic equator. A statistical analysis for the global distribution of static/spatial magnetic field perturbations using low-latitude Pi2 oscillation as a reference is a subject of future work.

Keywords: Pi2 pulsation