

Monitoring ion drifts by Dynasonde in the southern polar cap region

Young-Bae Ham¹, Geonhwa Jee*¹, Changsup Lee¹, Hyuck-Jin kwon¹, Jeong-Han Kim¹

¹ Korea Polar Research Institute

In 2014, Korea Polar Research Institute (KOPRI) established the second Korean Antarctic station, Jang Bogo station (JBS), in Terra Nova Bay (74.62 °S, 164.23 °E). In 2015, KOPRI installed an ionosonde at JBS, and it has been successfully monitoring the polar ionosphere with high temporal resolution (2-minute cadence) since 2017. The JBS's ionosonde is Dynasonde with Vertical Pulsed Ionosphere Radar (VIPIR) for transmit antenna, and we simply call it JVD (JBS-VIPIR-Dynasonde) here after. Among the various parameters from the JVD, we focused on the ion drift parameter in this paper. The high geomagnetic latitude (AACGM latitude ~ 79.87 °S) suggests that JBS is in the polar cap region, and it can be confirmed by the ion drift measurements. Statistical patterns of the ion drift measurements show an anti-sunward flow pattern, which is a well-known plasma flow pattern in the polar cap region. The high latitude ionospheric plasma convection is mainly driven by the solar wind and magnetospheric forcings, and our ion drift measurements also well exhibit dependency to the Interplanetary Magnetic Field (IMF) orientation; flow speed is enhanced for IMF southward condition, and flow patterns differ for IMF By conditions. In this paper, we discuss how the ion drift parameter is derived, and present our ion drift observation results.

Keywords: Polar ionosphere Ionosonde Dynasonde Ion drift