

Neutral and ion dynamics seen in GAIA with variable high-latitude input

*Chihiro Tao¹, Hidekatsu Jin¹, Hiroyuki Shinagawa¹, Yasunobu Miyoshi², Hitoshi Fujiwara³

1. National Institute of Information and Communications Technology, 2. Department of Earth and Planetary Sciences, Kyushu University, 3. Faculty of Science and Technology, Seikei University

Upper atmosphere shows variations reflecting complex interactions under inputs from lower and upper regions. These interactions have been an important target of the upper atmosphere physics and space weather purpose. GAIA, Ground-to-Topside Model of Atmosphere and Ionosphere for Aeronomy, is the whole atmosphere model including interaction with ionized plasma under solar EUV variation and a various waves input using a meteorological reanalysis data. We input magnetospheric variation into GAIA via electric field deposition at polar region and auroral electron precipitation using empirical models. We input polar electric potential map based on Weimer model driven by solar wind and interplanetary magnetic field with saturation effect of cross-polar-cap potential for large potential case. Variable auroral precipitation driven by Kp index is considered. Enhancement of total electron content upto mid-to-low latitude during the magnetospheric storm event is produced due to the consideration of penetration electric field. We will discuss application to neutral density variation and ionospheric storms in this presentation.

Keywords: GAIA, atmosphere-ionosphere coupling, high latitude variation