The variations of equatorial ionization anomaly observed from FORMOSAT-3/COSMIC during solar minimum period

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This study presents the temporal evolution of hemispheric asymmetry in equatorial ionization anomaly (EIA) for solstice months during solar minimum period. The global EIA distribution is constructed using the electron density profile data from FORMOSAT-3/COSMIC GPS Radio Occultation Experiment (GOX). The main result is that the asymmetry of EIA between two hemisphere is local time dependent. In solstice, the EIA in winter hemisphere is stronger than that in summer hemisphere in the morning, and which is inverse in the afternoon. The transition of stronger EIA crest from winter to summer hemisphere is typically around 1200-1300 LT during December solstice months, and is delayed by a couple of hours during June solstice months. This result may explain by the field-aligned plasma transport due to the trans-equatorial neutral wind, the equatorial fountain effect, and the ion drag effect during different local time and seasons. This result also supported by the SAMI2 ionospheric model simulations.