Analysis of Different Spread-F types and GPS Scintillation Occurrence over Bac Liu

#SEPTI PERWITASARI[1)],Kornyanat Hozumi[1)],Michi Nishioka[2)]
[(1]NICT,[(2]NICT

Equatorial spread-F (ESF) is one of the most important features in space weather because of its significant effect on communication and navigation. Therefore, real-time information on the ESF occurrence will be useful to detect the degradation of radio propagation conditions. We have developed a method to detect spread-F automatically for SEALION FMCW ionogram as a part of the plasma bubble alert system project. We used the 4th-degree polynomial fit and median filter to remove the noise in the ionogram and edge detection to determine the hF and foF2. We calculated the threshold of the non-spread-F ionogram within 100x100 pixels from the edge of hF and foF2. The Spread-F signature is classified into three categories: range type (Q), frequency type (F), and mixed-type (M). The validation using manual scaling data shows ~80% match. The seasonal variation shows that all types of ESF are higher at equinoxes. We further analyze the relationship between the spread-F types and the scintillation by comparing the different spread-F types with the occurrence of GPS scintillation using the s4 index over Bac Liu (9.30N, 105.71E) in 2019. The analysis is still ongoing, and the detailed result will be discussed during the presentation.