R006-P14
ポスター 1 ：9/24　PM1/PM2 （13:45-18:15）

#高橋　直子 [1)], 坂口　歌織 [1)], 中溝　葵 [1)], 今城　峻 [2)]
([1] 情報通信研究機構,[2] 京大・地磁気センター

Examination of method to separate noise from natural magnetic field measured on geostationary satellite

#Naoko Takahashi[1)],Kaori Sakaguchi[1)],Aoi Nakamizo[1)],Shun Imajo[2)]
([1]National Institute of Information and Communications Technology,[2]Data Analysis Center for Geomagnetism and Space Magnetism, Graduate School of Science, Kyoto Univ.

We examine the method to separate spacecraft noise from natural magnetic field measured on a geostationary satellite. The real-time measurement of magnetic field using in situ observation is one of powerful tools to immediately capture the magnetic storm. The separation of spacecraft noise from natural magnetic field is required, particularly using the magnetic field measurement without boom. In this study, the Fast Independent Component Analysis (FastICA) is introduced, which has applied for magnetic field data detected by two magnetometers onboard the first Quasi-Zenith Satellite (Imajo et al., 2021).

First, we evaluate the noise separation accuracy using GOES satellite data assuming that two/three/four magnetometers will be onboard a geostationary satellite. The magnetic field data including artificial noises, which factor depends on the distance from the noise source, are made from GOES satellite data. The noises are then separated from natural variations by FastICA. The noise separation accuracy is better when magnetometers are far away from each other. The number of magnetometers does not depend on the accuracy, which is not consistent with the suggestion in Imajo et al., (2021). However, the noise separation accuracy is better using more magnetometers when the noise amplitude is quite larger than the amplitude of natural variations (factor of about 10).

Next, we perform the noise separation method for ground magnetic field data assuming that the noise pattern is unknown. The ground experiment indicates that spiky noises with a period of about 2 min can be separated from natural variations. The period of spiky noise is similar with the oscillation related to the global distribution of magnetosphere (i.e., Pc5 pulsations), which suggests that the FastICA can be useful for the magnetic field measurement for the space weather.