TBExおよびFORMOSAT-7/COSMIC-3衛星を用いた赤道電離圏研究用の新ディジタルビーコン受信機
New digital beacon receiver for the study of equatorial ionosphere with satellites TBEx and FORMOSAT-7/COSMIC-2

*山本 衛1、岩田 桂一1、松永 真由美2、Tsunoda Roland3、Doe Richard3、Hsiao Tung-Yuan4
*Mamoru Yamamoto1, Keiichi Iwata1, Mayumi Matsunaga2, Roland Tsunoda3, Richard Doe3, Tung-Yuan Hsiao4

1.京都大学生存圏研究所、2.愛媛大学理工学研究科、3.SRI International、4.Hsing Wu University
1. Research Institute for Sustainable Humanosphere, Kyoto University, 2. Graduate School of Science and Engineering, Ehime University, 3. SRI International, 4. Hsing Wu University

We have successfully conducted observations of total-electron content (TEC) of the ionosphere using a satellite-to-ground beacon experiment. A unique dual-band (150/400MHz) digital receiver GRBR (GNU Radio Beacon Receiver) was developed for this purpose, which is based on the recent digital-signal processing technologies. The GRBR network was deployed into the southeast Asian and Pacific regions. By using beacon signals from the low-inclination satellite C/NOFS, we studied longitudinal "large-scale wave structures (LSWS)" in detail as a possible source of equatorial Spread-F (ESF) events. Now there are 2 new beacon-satellite plans. One is TBEx (Tandem Beacon Explorer), a project by SRI International, to fly a constellation of two 3U cubesats with tri band beacon transmitters. Another one is a constellation of FORMOSAT-7/COSMIC-2 satellites, also with tri band (or quad-band) beacon transmitters. All of these satellites will be placed into low-inclination orbits by the same launch vehicle in late 2016. This launch will provide great opportunities to enhance studies of the low-latitude ionosphere. Kyoto University, Ehime University and Hsing Wu University are now developing the new GRBR system that is expected to be used for the TBEx and FORMOSAT-7/COSMIC-2 beacon experiments. In the presentation we will show development of the new beacon receiver together with plan of observations.

Keywords: Satellite-ground beacon experiment, Ionospheric TEC, COSMIC-2, cubesat, equatorial ionosphere