Xilinx 社 ZYNQ-7000 SoC を用いた FMCW イオノゾンデ・プロトタイプの開発

石橋 弘光 [1]; 近藤 巧 [2]; 津川 卓也 [1]; 石井 守 [1]
[1] 情報通信研究機構; [2] NICT

The development of the FMCW ionosonde prototype system based on the Xilinx ZYNQ-7000 SoC

Hiromitsu Ishibashi[1]; Takumi Kondo[2]; Takuya Tsugawa[1]; Mamoru Ishii[1]
[1] NICT; [2] NICT

NICT's portable and low-power FMCW (Frequency Modulated Continuous Wave) ionosonde system has been under operation for over 10 years as part of the SEALION (Southeast Asia Low-latitude Ionospheric Network) project. Because of system deterioration and frequent lightning damages in Southeast Asia monsoonal region, it becomes difficult to maintain the system and keep observations. Therefore, the development of a new ionosonde system is urgent issue for us to improve the SEALION.

The first attempt has been already presented at the SGEPSS 2016 fall meeting: we successfully got ionograms using a hybrid system that incorporates current FMCW ionosonde and Ettus Research USRP N210. After that, for the purpose of the control of current peripheral units, we also tried X300 USRP which has the GPIO interface (SGEPSS 2017 fall meeting). However, because we found some fatal technical problems, we were forced to abandon our FMCW ionosonde replacement plan using the USRP.

This presentation is a subsequent follow-up report for these past 2 years. We will show the newly developed prototype of FMCW ionosonde system based on the Xilinx ZYNQ-7000 SoC with hardware and software programmability. In addition, we will present the self-built transmitting module with the control PC of Raspberry Pi 2 which successfully functions as the replacement of current FMCW ionosonde transmitting system.