

西オングル VLF/ELF 自然電波観測の現状

岡田雅樹¹、山岸久雄¹

¹ 国立極地研究所 (NIPR)

Status of VLF/ELF Observation at West-Ongul Island

Masaki Okada¹, Hisao Yamagishi¹

¹National Institute of Polar Research

We have deployed a new VLF wideband monitoring system for Syowa Station since JARE53, 2012. This system is designed to monitor 25Hz to 50kHz of natural VLF waves at the West Ongul Island, where UAP monitoring site is located about 5km remote from Syowa Station in order to avoid noise of Syowa Station and has been continued to observe since 1976. Electric Power of this station has been supplied only by solar batteries until 2008. A new hybrid power supply system at West Ongul monitoring site has been deployed in 2009. New VLF wideband observation system has deployed in January 2012 which has been observing VLF natural EM wave emission at the West-ongul island.

The power resource is limited at the isolated observation site in Antarctica. We have deployed a hybrid power generation system in west Ongul island. This system has two electric power sources. One is the solar power generator and the other is the wind power generator. Still the power consumption of the observation system has to be minimized to about 20W including the VLF wideband sampling system and the wireless link between west Ongul island and east Ongul island where the Syowa Station is located. We have adopted a FPGA based A/D sampling system (CompactRIO(R) made by National Instruments Corp.) up to 10kHz for VLF monitoring at west ongul island and transferred the observation data with wireless LAN link, then recorded at Syowa Station in east ongul island. The FPGA system enables us a low power consumption and reconfigurable observation system. We have successfully obtained sample data by using this system during JARE53.

Figure 1 shows the data obtained by the logger system deployed at Observation hut in West ongul island on January 23, 2013. VLF emission whose frequency ranges up to 2.5kHz is clearly observed in night time. Constant emission below 1kHz is also observed. According to the data obtained during JARE53, the data transmission band width between West-ongul and East ongul is more than 200kbps even in mid-winter time. The noise level in West-ongul island is found to be extremely low relative to East-ongul island.

By using this logger system, the monitoring observation at West-ongul island, such as VLF multi-channel observation, UL F observation, ELF observation and Riometer observation are also tested during JARE54 and JARE55.