

## Development of GPS data remote retrieval system using wireless LAN

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An exploratory research project titled “Experiments for remote data retrieval with wireless communication and long term continuous measurement to apply field GPS measurements” was planned in the first half of VIIIth Phase of the Japanese Antarctica Research Expedition (JARE). We commenced with design and development of the dual-frequency GPS data remote retrieval system with wireless LAN in 2009. The system consists of ground observation unit which is composed of dual-frequency GPS logger and data transmission unit, and data retrieval unit. In this system, we use a ZigBee communication to transmit control commands (2.4GHz, 250Kbps) and a wireless LAN communication to transmit GPS data (2.4GHz, 54Mbps). Every 30-second data re-sampled at every 00UT from 1-second data are transmitted.

We conducted three data transmission tests with the system, that is, 1) ground data retrieval test, 2) data retrieval test from air space with a small unmanned aerial vehicle, and 3) actual GPS data retrieval tests from GPS buoy deployed on a sea ice at Nisi-no-ura Cove in Syowa Station, Antarctica. At 1), we got all the data from the ground observation unit situated at the distances of less than 400 m. At 2), we obtained the data of approximately 24.5MB by the aerial vehicle at the heights of lower than 250 m. At 3), the data of approximately 23.5MB of the GPS buoy were also collected successfully within 10 minutes. It allows a continuous measurement without interruption at the measured data collection.

The details about this study have already been described in Doi et al. (2012).

### References

Doi K., Y. Aoyama, M. Funaki, S. Osono and H. Hayakawa, Development of GPS data remote retrieval system using wireless LAN, *Nankyoku shiryô (Antarctic Record)*, 56(3), 435-446 , 2012.