Making and Evaluation of Small GNSS Observation Equipment

*Takayuki Miyazaki[1]

1. GSI of Japan

GSI of Japan established GNSS continuous observation system (GEONET) which consists of 1300 GNSS observation stations and cover almost of Japan region. When earthquake occur in Japan, GSI calculates crustal deformation and fault model from GEONET data and release it.

GEONET is quite effective for subduction-zone earthquake event because averaged span of GEONET station is about 20 km. But for inland earthquake, GEONET does not always detect crustal deformation sufficiently.

GSI also developed Remote GNSS Monitoring System (REGMOS) for severe observation condition e.g. upper part of volcano etc.. REGMOS expands GNSS observable region because of its high endurance design for low temperature, strong wind and snow. Consequently, weight and dimension of REGMOS are not suitable for dense expansion of GNSS observation network.

In this study, we developed small and low cost GNSS observation equipment for spatially dense expansion of GNSS observation network keeping positioning precision. We use u-blox M8T module for GNSS receiver and combine control PC: raspberryPi3, battery, solar panel, wireless communication module: xbee PRO. We evaluated our GNSS observation equipment. As a result, our observation equipment shows few mm s.d. in static analysis.

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