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Remote monitoring using mobile network for magnetotelluric observation

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Introducing the state-of-the-art mobile magnetotelluric(MT) observation system (LEMI-417), a long-period MT observation project has been observing MT data at Tohoku district, northeastern Japan for the aim of 3-D electrical conductivity distribution in the wedge mantle. A result analyzing obtained data indicates that electrically conductive zones correspond with seismic low velocity zones. The MT observation is operated in stand-alone. In past observations, there were many accidents in which wild animals and others harmed telluric cables and electrodes. Therefore it is important to perceive those anomalies as soon as possible.

In recent years, mobile network comes to be more accessible with the introduction of flat-rate and the expansion of service area. Though the stability and security are inferior to wired network, it is possible to access the Internet anywhere within the service area. In some of seismic and GPS observation sites in Tohoku University performs the remote maintenance and the automated data collection by telemeter system using a mobile data communications terminal.

We propose a data transmission system adopted to LEMI-417 system using mobile network for remote monitoring of MT observation data. We found that some MT observation sites are located within NTT docomo's FOMA service area. By access during pre-determined time, we can check observation data from our university in real-time. Our system was installed at an observation site in Izumi-ku, Sendai in November 21, 2011. In this presentation, we will report overview, operational status and problems of our system.

Keywords: Magnetotelluric(MT) observation, remote monitoring, mobile network