Significant Role of Remote Sensing Technology in Geology Explorations

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In the last decades, remote sensing technology were facing problem to identify ground surface under tropical region. The clouds and thick vegetation always become an obstacle for remote sensing sensor to reveal surface geology feature. Therefore, the benefit of satellite data for geology exploration as well as hazard mitigation might be less effective. Nowadays, remote sensing technology seems to be approaching a new era in the use of microwave region onboard space borne termed as Synthetic Aperture Radar (SAR) sensor. In contrast with optical sensor, the SAR satellite generates its own signal in microwave frequency and receives the back-scattering intensity from material at surface, the sensor works regardless time acquisition and clouds cover especially at low frequency. In this paper, we discuss our achievements in the use of SAR sensor especially at frequency L-band for geological explorations. For geology explorations we present the effectiveness of SAR sensor to detect the fluid path of geothermal system and estimate spatially the geothermal potentials. The capability of SAR sensor to detect rock type distribution at active volcanoes, could be detected clearly even though ash and smoke covered the summit. We present four study areas as follows: Songa Island and Mt. Ciremai for geothermal explorations. Mt. Merapi and Mt. Tangkuban parahu for detecting new volcanic product and rock mapping. The ground check and published data are always used for validating our result. Furthermore, the correctness of applied methods could be calculated.

Keywords: SAR, geology, geothermal, explorations.