On the Performance of Terrestrial Laser Scanner for Volcanic and Landslide Hazard Assessment in Indonesia

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SUMMARY

This study focuses on the performance of the Terrestrial Laser Scanner (TLS) surveys for natural hazard assessment related to volcanic eruption and landslide in several locations in Indonesia. In this case, TLS surveys are useful for several risk mapping and assessment purposes, e.g. deformation monitoring and analysis, potential hazard evaluation and analysis, and for updating the related hazard maps. The study areas for this research are: Galunggung, Papandayan, Talaga Bodas and Tangkuban Parahu volcanoes; and landslide prone area of Ciloto in West Java. TLS observation environment in the study areas has usually unique and dynamic environment, either related to geomorphology, land cover, surface activity, or local atmospheric variation, which in turn will affect the quality of TLS data and results. This research investigates the quantitative relation between those observation environment variables with the obtained quality of TLS point cloud and the derived digital elevation model and related information. This paper will present and analyze the obtained results. Potential prospects and limitation of TLS for natural hazard assessment in tropical region as Indonesia are also discussed.