

Development of a Ground-based Synthetic Aperture Radar for Land Deformation Monitoring

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Abstract :

Every year, over one million people are exposed to weather-related landslide hazards around the World. Due to the recent climate change, it is likely that the decrease of permafrost areas, changes in precipitation patterns and increase of extreme weather events will influence the weather-related mass movement activities. This paper reports the recent development of a ground-based synthetic aperture radar (GBSAR) for continuous monitoring of landslide-prone areas in Malaysia. It is an ultra-wideband system operating at 17 GHz with spatial resolution of 0.3 m in range and 5.8 mrad in cross range. The system is mounted on a rail which travels along a linear guide to achieve SAR imaging. The GBSAR has been installed at a test site to provide timely information for landslide monitoring and early warning system. The paper discusses the design, development and field experiments using the new GBSAR system.