

Landslide Movement Monitoring using Differential Global Positioning System

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ABSTRACT:

Real-time deformation data for a large slow moving translational landslide in the Tsing Shan Foothills has been collected using a real-time remotely operated Differential Global Positioning System (DGPS) since April 2008. The DGPS system installed comprised three monitoring antennas within the landslide body and a local reference station in an area of stable ground nearby to the landslide site. Survey data was collected using the real-time kinematic surveying technique throughout the monitoring period and transmitted back to a study-specific Instrumentation Database System housed at the Geotechnical Engineering Office of the HKSAR Government.

The initial performance of the system was compromised by intermittent loss of transmission signal, and subsequent loss of 'real-time' data recording functionality. However, the reliability of the wireless transmission system increased substantially following the change of transmission equipment from 2G to a 3G network.

The data recorded by the monitoring system indicated a strong correlation between periods of accelerated ground movements and heavy or prolonged rainfall and confirms that DGPS is an effective means of monitoring slope deformation.