

Monitoring deformation of giant fossil landslide at the Zhouqu segment in the Bailongjiang Basin using Sentinel-1 time series interferometry technique

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Abstract

The Zhouqu–Wudu segment of the Bailongjiang Basin in Northwest of China with a total area of 8917 km² lies in the middle south of the west wing of Qinling orogen. It is controlled by Qinghai–Tibet tectonic belt and Wudu arc structure, and affected by unlift of the Qinghai–Tibet plateau. This segment is located in the Qinling Mountains, and is surrounded by the Qinghai–Tibet Plateau, the Loess Plateau and the Sichuan Basin as the three major geomorphic units. Because of its geophysical conditions, the Bailongjiang Basin is one of the most severely landslide affected regions in China. More than 2000 medium and large landslides have been reported within the Wudu and Zhouqu segment. In this paper, 50 newly launched Sentinel-1 scenes from November 2014 to September 2016 are gathered, and a preprocessing chain of TOPS with SBAS-InSAR are generated to obtain the time series deformation, the active area within the five typical giant fossil landslides in the study area were detected, the maximum deformation and the average deformation were verified by field investigation and the displacement monitor measurements in the local landslide early warning system.

Key words: giant fossil landslide, SBAS technology; Time series analysis; Sentinel-1 TOPS, Zhouqu to Wudu segment, China