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Detection of mountain glacier velocity in west-side of Kunlun mountain using ALOS/PALSAR

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On 20 March 2008, an earthquake (M7.2/USGS) struck Yutian county, Xinjiang, China. Using ascending ALOS/PALSAR data, we detected associated crustal deformation signals and nearby glacier signals as well. In this paper, we concentrate on the glacier motion, and examine if the glacier motion was accelerated by the earthquake. Using time series ALOS/PALSAR data from Aug. 2007 to Dec. 2009, we detected glacier motion by offset-tracking method in small baseline perpendicular data pair. Glacier motion shows significant seasonal fluctuations. To examine the possibility of triggered acceleration, we compared data acquired at the same season. To begin with, we compared confirmed that the data acquired on Jan. 2008 and Jan. 2009 revealed very small differences in the glacier velocity. Meanwhile, we compared two data sets, one of which included the earthquake but the other did not. Obviously, the former velocity field exceeded the latter. Examining another glacier similarly, we derived the same result. These data suggest that mountain glacier around the epicenter was accelerated, triggered by the Yutian earthquake.

Keywords: ALOS/PALSAR, Mountain glacier, earthquake