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CRUSTAL UPLIFT DUE TO ICE MASS LOSS IN COLUMBIA GLACIER ASSESSED BY TANDEM-X INSAR

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ABSTRACT:

Advanced Synthetic Aperture Radar Interferometry (InSAR) technique can help estimate the ice mass loss in glaciers. Although InSAR is not able to measure up to several meters per day motion in glaciers directly, it can measure elastic rebound deformation in crust as a response to massive ice loss. In this study we assess crustal uplift caused by recent ice loss in Columbia glacier, Alaska. Columbia glacier has been rapidly retreating during the past decades. As a super test site of TanDEM-X mission, a large collection of SAR data is available in this region with temporal resolution of 11 or 22 days in both ascending and descending orbits. Using InSAR time-series analysis of 1-year TanDEM-X images acquired between June 2011 and May 2012, we estimate the deformation in the areas nearby the glacier. Then, the InSAR results are used to constrain parameters of elastic and viscoelastic surface deformation model in response to ice loss.

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