



C13D-0873: Tide-corrected strain rate and crevasses of Campbell Glacier Tongue in East Antarctica measured by SAR interferometry

Monday, 12 December 2016

13:40 - 18:00

📍 *Moscone South - Poster Hall*

Measurement of flow velocity strain rate of a floating glacier is critical to the investigation of detailed flow regime and crevassing mechanism. We measured the surface deformation of Campbell Glacier Tongue (CGT) in East Antarctica from the 14 COSMO-SkyMed one-day tandem differential interferometric SAR (DInSAR) image pairs obtained in 2011. By removing the vertical tidal deflection obtained from the double-differential InSAR (DDInSAR) signals, we derived the tide-corrected ice-flow velocity and strain rate of CGT. The vertical tidal deflection of CGT was estimated by multiplying the tidal variations corresponding to the DInSAR images by the DDInSAR-derived tide deflection ratio, which was removed from the DInSAR signals to extract ice velocity only. The orientation of crevasses in CGT was nearly perpendicular to the direction of the most tensile strain rate calculated from the tide-corrected ice velocity. This demonstrates that the crevasses form by ice flow in respect of the DInSAR accuracy, not by tidal deflection. The tide correction of DInSAR signals over floating glaciers by using the DDInSAR-derived tide deflection ratio is useful for estimating accurate ice velocity and strain rate for analyzing crevasses. The tide-corrected ice velocity and strain rate will thus be of great value in a better understating of ice dynamics of floating glaciers. This research was funded by National Research Foundation of Korea (NRF-2016R1D1A1A09916630).

Authors

Hoonyol Lee

Kangwon National University

Hyangsun Han *

Korea Polar Research Institute

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