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Attempt to measure Antarctic ice sheet thickness change with GPS (subsequent report)

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We cannot estimate height change of a certain fixed point in a coordinate system by a GPS measurement on an ice sheet, although flow vector of the ice sheet can be obtained precisely, because the site a GPS antenna deployed moves along with the ice sheet flow. In order to measure height change of a point fixed in a coordinate system, we suggested a method in Doi et al. (2009). The method is doing GPS measurements repeatedly along a flow line on an ice sheet the flow direction of which is known. We can obtain height difference between first passing of GPS antenna and second passing at the same point. The height difference corresponds to ice sheet thickness change between the epochs of the first passing and the second passing. Continuous GPS measurements had been conducted at P50 (-69.0272N, 40.0392E) on an Antarctic ice sheet in 200 7 (Arai et al. 2009). We deployed two GPSs in 2008 and 2009 on the flowage track of GPS antenna deployed in 2007 in order to estimate measurement accuracy of the height difference by the method proposed above.
We will show the analyzed result of GPS measurements for three years, and also suggest a new system to monitor ice sheet thickness change in the presentation.

Keywords: GPS, Antarctica ice sheet, ice thickness change