Kinematic GPS Precise Point Positioning versus Kinematic Differential GPS Positioning for the Observation of the Ocean Surface Height along the Drake (Antarctica) passage

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The knowledge of an accurate mean ocean surface is a challenge for oceanographic researches. Indeed, this information is needed for estimating the dynamic of the geostrophic flows. In particular, the dynamic of the circumpolar flow around Antarctica is high along the Drake passage and need to be known with accuracy.

A 15-days geodetic campaign which has been conducted in 2009 along the DRAKE passage. The scientific ship POLARSTERN has been equipped with four 1Hz GPS antennas, one onboarded altimeter and one relative gravimeter. The ship followed the JASON-2 ground track. One buoy equipped with GPS was used to calibrate the onboarded system.

GPS results have been obtained following two strategies. In the first one GPS data have been processed with a Kalman Filter constrained by the well known geometry of the four onboarded GPS antennas. In the second approach, the Kalman Filter has been extended to make Differential Kinematic processing based on single difference. In the limit of baselines shorter than a few hundreds kilometers, we compare both results. We show the accuracy of PPP with respect to classical differential techniques and discuss the problems we met. In a larger extend, this poster aims to present and evaluate the capability of PPP using CNES-CLS IGS analysis center products for oceanographic studies (without the problem of the baseline length) .