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Absolute calibration of Saral/altiKa on Lake Issykkul from GPS field

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Within the framework of Jason-2 mission, a Cal-Val project including continental waters (Rivers and lakes) had been setup in 2007. It includes installation of permanent site (meteo station, limnigraphs, GPS reference point) and regular field campaign for the whole lifetime of the satellite. The lake Issykkul in Kyrgyzstan has been chosen as site dedicated to lakes following a preliminary project in 2004 on this lake. It is funded by CNES.
Over the last decade more and more scientific studies were using satellite altimetry to monitor inland waters. However, same as for ocean studies, linking time series from different missions require to accurately monitoring the biases and drifts for each parameter contributing to the final estimate of the reflector height. Moreover there is clear evidence that the calibration of satellite altimetry over ocean does not apply to inland seas (e.g., corrections, retracking, geographical effects).
Regional Cal/Val sites supply invaluable data to formally establish the error budget of altimetry over continental water bodies, in addition to the global mission biases and drift monitoring.
Moreover the variety of calibration sites for altimetry had to be enlarged in order to have more global distribution and more robust assessment of the altimetry system, and to check if specific conditions lead to different estimation of absolute bias of the instruments. Calibration over lakes surfaces for example has interesting characteristics with respect to ocean surface: wave and ocean tides are generally low, and to summarize, dynamic variability is much smaller than in the oceanic domain.
CAL/VAL activities on the oceanic domain have a long history and protocols are well established. CAL/VAL activities on lakes are much recent but in turn they address other problems such as the performance of the various tracking/retracking algorithms and more globally assess the quality of the geophysical corrections. This is achievable when measurements of specific and numerous field campaigns and ground permanent network of level gauges and meteo stations are processed to detect biases, errors in the geophysical corrections, etc. 10 campaigns with GPS receivers have been conducted on Issykkul lake (2004, 2005, 2008 2 in 2009, 2010, 2011, 2012, 2013 and 2014), with receivers installed on a boat, and receivers on the shore. Cruise with GPS data along the ground track of each satellite were conducted. They allow estimating absolute bias of each altimeter, and relative bias between them. Cruise also allowed mapping the profile of the mean lake surface which is very steep in the case of the Lake Issykkul. We present here the results obtained from the last 2 campaign dedicated to the cal/val of the altKa altimeter onboard the Saral mission.