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Terrestrial Water Storage Monitoring from GRACE and Satellite Altimetry in the Okawango Delta (Botswana)

O. B. Andersen (1), P. Bauer-Gottwein (2), R. Smith (3), P. Berry (3), P. E. Krogh (1)

(1) DTU-Space, Juliane Maries Vej, 30 DK-2100 Copenhagen, Denmark

(2) DTU- Ressources, Lyngby, Denmark

(3) De Montford University, Leiceister, UK. (oa@space.dtu.dk)

Merging remote sensing data from GRACE and satellite altimetry is important to monitor the water balance of large un-gauged regions and can serve for calibration of and assimilation into hydrological models. The GRACE gravity changes are analyzed using a local MASCON approach derived by NASA/GSFC, solving for mass change at 10-day intervals using 4 deg X 4 deg blocks from GRACE level 1B data. Satellite altimetry over the region has been retracked using the EAPRS Expert-retracker System.The EAPRS system has the ability to recovers nearly un-interrupted time series over rivers. GRACE derived mass change from 2002 to 2006 have been studied along with altimetry for the same period.

The target region for the Danish HYDROGRAV project is the Okawango Delta in Botswana which pulsates at annual scales causing the flooding of large parts of the delta. In particularly, satellite altimetry from the ENVISAT has the ability of modeling the changes waterlevel upstream in the Okawango river, GRACE gravitmetry can model the integrated amount of ground and river water on monthly to inter-annual scales which is an important parameter for constraining hydrological models