Geophysical Research Abstracts, Vol. 9, 11476, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-11476

Merging GRACE gravimetry, satellite altimetry and in-situ data for Terrestrial water storage and flood monitoring

O. B. Andersen (1), P. Berry (2), J. Freeman (2), M. Butts (3), F. Jakobsen (4), P. B. Gottwein (5), F. G. Lemoine (6), S. B. Lutcke (6)

(1) Danish National Space Center, Copenhagen, Denmark (oa@spaceenter.dk), (2) DMU, De Montford University, Leiceister, UK, (3) DHI Water and Ressources, Denmark, (4) DTU, Water and Environment, Lyngby, Denmark, (5) NASA, GSFC, Greenbelt, MD, USA

In this study we investigate the possibility of merging e remote sensing data from GRACE and satellite altimetry as a supplement to existing hydrological data like river gauges and models. The GRACE gravity changes are analysed 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 in order to derive height of rivers, in particular the Ganges and Brahmaputra rivers. The EAPRS system has the ability to recovers nearly un-interrupted time series over these rivers. GRACE derived mass change from 2002 to 2004 have been studied along with altimetry for the same period.

The two main regions of interest are the Okawanga Delta in Botswana which pulsates at annual scales causing the flooding of large regions and the monsoon related floods in Bangladesh. In particularly, ENVISAT has the ability of modeling the changes up-stream the rivers, which is a major causing factor. 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.