

**Extended mass flux data records from GRACE and other satellites**

Srinivas Bettadpur<sup>†</sup>; Minkang Cheng; John Ries; Byron Tapley

<sup>†</sup> University of Texas Center for Space Research, USA

Leading author: [srinivas@csr.utexas.edu](mailto:srinivas@csr.utexas.edu)

The joint NASA/DLR mission GRACE has firmly established the value of space-based gravity measurements as a means of monitoring the global mass flux at time-scales of few weeks and longer, and spatial scales of 300 km and larger. The GRACE data has been applied for studies of physical processes connected to ocean variability, land surface hydrology, ice-sheet dynamics, and the structure of the solid Earth. There is thus an understandable need to extend these mass flux records, albeit at reduced resolution or accuracy, to the epochs before the 2002 GRACE launch, using tracking data to other Earth orbiting satellites. Such an effort is also relevant to ensuring the continuity of mass flux measurements in the periods between the end of GRACE and the beginning of the GRACE Follow On missions. In this paper, we report on the information content in a compatibly processed long-duration mass flux time-series, of heterogeneous spatio-temporal resolution, from GRACE and from other satellites. For epochs after 2002, the results derive from a GRACE data re-processing effort currently underway. For epochs between 1976 and 2002, we have used laser and radiometric tracking data to diverse satellites to obtain, using GRACE-compatible processing standards, the long-wavelength global mass flux estimates. We will conclude with brief remarks on the prospects for bridging potential data gaps in the future.