



Time-variable gravity fields from satellite tracking

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At the University of Texas Center for Space Research (CSR), we routinely deliver time-series of Earth's gravity field variations, some of it spanning more than two decades. These time-series are derived - in a consistent manner - from satellite laser ranging (SLR) data, from low-Earth orbiters tracked using GPS, and from low-low satellite to satellite tracking data from GRACE.

In this paper, we review the information content in the gravity field time-series derived from each of these methods. We provide a comparison of the time-series at the decadal and annual time-scales, and identify the spatial modes of variability that are well or poorly estimated by each of the observing systems. The results have important bearing on the prospects of extending GRACE time-variable gravity time-series in the event of gaps between dedicated gravity missions, and for extending the time-series into the past.

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