



The use of data from DORIS tracked satellites for recovery of time-variable gravity

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The time series used to construct solutions for time-variable gravity (TVG) have relied on tracking of SLR satellites, including the Lageos 1/2 satellites, Starlette, Ajisai, and Stella. The SLR and DORIS data from TOPEX also play a critical role in these solutions. The DORIS data augment the tracking coverage and the capacity to observe the signal of time-variable gravity. The DORIS tracking system has been gradually expanded since the first public release of the data for SPOT-2 in 1990, and its use on TOPEX/Poseidon beginning in 1992. Since the late 1990's the DORIS receiver has been available on SPOT-4 (since 1998), SPOT-5 & ENVISAT (beginning in 2002), and TOPEX (through November 2004). Because of the South Atlantic Anomaly effect on the DORIS receiver for JASON, we do not consider the DORIS data from this satellite. We evaluate the contribution of the DORIS data on the SPOT and ENVISAT satellites on time-variable gravity recovery for the period from 2000-2004. We discuss the modelling required for these satellites and the orbit determination accuracies that we obtain in our work, noting that the use of the new GRACE-derived gravity models makes particular improvements in the orbit quality for ENVISAT. We evaluate the contribution of these satellites to the time-series. We show comparisons to the SLR based TVG series, as well as with GRACE.