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Antarctic ice mass change from GRACE using short-arc orbit determinations

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Regional solutions using gravitational basis functions with compact support have the potential to recover higher spatial resolutions of gravity field change from GRACE than long-arc methods based on spherical harmonics. Our short-arc orbit determinations process the GRACE inter-satellite range rates, Cartesian positioning from GPS and the accelerometer data. We will outline our methodology and present results of (i) orbit determination strategies where the parameters include the initial state vectors, accelerometer scale and bias for both GRACE satellites and the k-band inter-satellite range rate bias; (ii) the dependency of the solution on the choice of shape parameters defining the radial basis functions and (iii) the ice-mass change over Antarctica from our methodology with comparisons against results recovered from long-arc solutions.