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Data Sets and Inverse Strategies for Global Surface Mass Variations

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We use GPS, a data-assimilated ocean bottom pressure (OBP) model and GRACE data combination to estimate surface mass variations up to degree and order 60. The estimates have recently been updated to include the first half of 2009 using fully-reprocessed GPS data from the IGS network. Since the geodetic systems are complex and some are still in their early stages of data production, our objectives are to compare data where they overlap and combine where they complement. For example, one such effort is to produce a continuous stream of high-quality degree-1 surface mass variation estimates to support the GRACE mission for a complete coverage of the spherical harmonic spectrum. We will explore the robustness and the information contents of the various data sets, and investigate different combination strategies to enhance the reliability and quality of the estimates. We will also discuss values and problems of using geophysical models as a priori parameter information in the inversion process.