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Mascon Solutions from GRACE: Status and Applications

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We have developed a strategy to determine solutions of mass flux from GRACE using mascons, and successfully applied these techniques to quantify mass variations in the cryosphere (e.g. Alaska, Greenland, and Antarctica), over the period 2003 to 2008. In addition, we are developing global solutions on an equal area grid, with one focus the recovery of land hydrology variations. The solutions take the form of direct Level-2 solutions in either drainage basins or equal area grids, at intervals of every ten days, and are estimated directly from the GRACE KBRR data. We give an overview of the latest results. Mascons offer a number of advantages over spherical harmonic solutions – the most important of which that they are basis functions that can localize the signal, and minimize leakage of unmodelled effects across the solution space. We describe the derivation of the solutions, including the application of separate constraints for different land and ocean regions. The benefits of a priori forward modeling of hydrology are also discussed.