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Terrestrial Water Storage Change: Preliminary Results from GRACE

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Abstract: In this presentation we discuss preliminary results of estimating terrestrial water storage variations using GRACE time-variable gravity fields. GRACE-derived results will be compared with estimates from two advanced hydrological models, the NCEP Climate Prediction Center's land data assimilation system and NASA Goddard Space Flight Center's global land data assimilation system. Preliminary results show good agreement between GRACE and model estimates. Problems and limitations associated with gravity changes of high degree and order will be discussed. Uncertainties of low degree and order GRACE observations will also be discussed. Independent determination of low degree and order gravity change from Earth rotation and satellite ranging data will be used to strengthen GRACE time-variable gravity field, and therefore to improve the estimate of terrestrial water storage variations using GRACE.