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**The attraction of water**

**- Using GRACE satellite gravity data to improve our understanding of the global water cycle -**

**Abstract**

The gravity satellite mission GRACE (Gravity Recovery and Climate Experiment) provides a new type of data for integrated Earth system research including climate studies, ocean and sea level research, large-scale hydrological modeling and solid-Earth geophysics. Time-variable gravity enables, for the first time, a direct measurement of the amount of water mass that is redistributed at or near the surface of the Earth through the hydrological cycle and by oceanic and atmospheric circulation. In this presentation I will briefly explain how gravity field models can be computed from the satellite observations and will describe the chances this type of measurement offers for water cycle analysis. Applications include the quantification of ice mass changes resulting in sea level rise, the improvement of hydrological modeling through model validation and data assimilation, and the identification of anthropogenic influences on the water cycle.