

Results from a GNSS Altimetry OSSE

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GNSS signals reflected from the Earth's surface may be used for a variety of remote sensing applications, though most science applications require altimetric or scatterometric measurements. GNSS altimetry measures the time of arrival of a reflected GNSS signal relative to the direct signal reception, giving information on the height of the reflecting surface., while scatterometric observations use the reflected signal's calibrated peak power level and perhaps decay time. Because the instrument requirements for GNSS altimetry typically include those of scatterometry, a GNSS altimeter is also naturally a GNSS scatterometer. Thus, although more difficult to achieve, a GNSS altimeter will have more science measurement opportunities.

Work is currently underway on developing a GNSS altimetry Observation System Simulation Experiment (OSSE) to make a more detailed assessment of this technique for global space-based applications. Some GNSS altimetric science topics include mesoscale ocean topography, sea-ice freeboard and extent, and ice-sheet lake volume. We present some preliminary results of our OSSE simulations. This will include assessment of the transmitted signals and their processing algorithms, and the effects of the GNSS orbit inclination. We will present new results on altimetric precision and accuracy and compare to previously published work. An assessment of spatial and temporal resolution will be included. Finally, an assimilation study showing the science return as a function of mission parameters for mesoscale oceanography will be shown.