

ASSIMILATION OF ALTIMETER AND GEOID DATA INTO A GLOBAL OCEAN MODEL

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A major problem in physical oceanography is the determination of the general circulation and its associated transport of mass, heat and tracers from data. Density can be measured and pressure field can be calculated from temperature and salinity. Geostrophic currents can merely be derived relative to some unknown reference velocity.

As a reference a surface geostrophic velocity can be calculated from the slope of the sea surface height (SSH), which is measured by satellite altimetry. To get absolute values for the sea surface elevation relative to the equipotential surface, which corresponds to the geoid, we want to assimilate not only altimeter data but also geoid heights into a global ocean model. Therefor we use the adjoint technique which preserves the model balances of mass, heat, salt and momentum.

Until nowadays the assimilation of geoid heights has been done only in few cases, because the accuracy of the available gravity models is not sufficient. With the new CHAMP satellite and future satellite missions we will get highly improved gravity models. As long as there are no data from these new satellites available we use the GRIM5-S1 gravity model for our first experiments. The advantage of such a satellite only geoid is the independence of altimeter data and therefore the possibility to inspect the consistence of the different datasets. The results of these studys are presented here.