Geophysical Research Abstracts,
Vol. 11, EGU2009-9615-1, 2009
EGU General Assembly 2009


# Simulation of particle spectra and deep water organic matter fluxes

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The amount of carbon exported to the deep ocean depends on the surface primary productivity, decay rate of sinking particles and their sinking speed. A range of sinking speeds has been observed in the ocean, which is determined by particle composition and density. Aggregation is an important process that increases particle size and possibly the sinking velocity of particles. By implementing an aggregation model into a biogeochemical model to simulate the number and size distribution of particles in the water column we estimated organic matter fluxes in the highly productive coastal upwelling system of NW Africa. The particle aggregation model is based on a continuous size spectrum of aggregates, identified by the prognostic aggregate mass and aggregate number concentration. Collision of particles is resulted from turbulent shear and differential settling. The modified biogeochemical model is comprised of 7 compartments: phytoplankton, zooplankton, ammonium, nitrate, detritus, chlorophyll to carbon ratio and aggregate number concentration. The aggregates are made up of phytoplankton and detritus and characterised by prognostic sinking velocity. A depth dependent disaggregation term conserves mass but generates more, smaller and slower particles. Aggregates with different densities were used in the model experiments. Although particle fluxes at the mesotrophic sediment trap site CB has been successfully reproduced by the porous aggregates, the model failed to estimate particle number spectra. We present results from model experiments with varying aggregate properties. Model predictions following the implementation of observed fractal dimension are also presented.