



Biogeochemical and hydrographical investigations in the Beibu Gulf, South China Sea during southwest Monsoon: First Results from the FENDOU-5 cruise

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The bilateral German / Chinese research project 'BEIBU' started in July 2009 with the research focus on the Beibu Gulf area in the South China Sea. The area is of special scientific interest as it plays a crucial role for the understanding of naturally and anthropogenically induced matter and energy fluxes at the South China Sea north-western coastal areas. The recent biogeochemical processes in the Gulf area reveal the response of element fluxes and the ecosystem to human activities which are reflected by the composition of both the water column and the surface sediments. The long-term general aim of the project is a budget of meso- to large-scale energy and material fluxes of the Beibu Gulf as an answer to natural and anthropogenic forces.

We present here the first results from a joint sea expedition with scientists from Germany and China using the Chinese R/V FENDOU-5 in September / October 2009. It is planned to extend the investigations on a second cruise with the German R/V SONNE in 2011.

We present first results from the R/V FENDOU5 cruise related to the following tasks:

- a) Hydrographical profiling and biogeochemical measurements of the water column properties (e.g., salinity, temperature, chlorophyll a, nutrients, turbidity, trace metals, POC, SPM contents), and
- b) Sampling of water bodies and sediments (including pore water) with respect to:
 - Biogeochemical processes and terrigenous material inputs in the water column, and the surface sediments
 - Phosphorous (P) and iron (Fe) speciation in the sediments, and
 - Organic pollutants in the water column and surface sediments.

Samples have been recovered at overall 29 stations by different devices, as for instance, Pump-CTD, plankton net, MUC, GC, and box corer. Pore waters were obtained by the application of rhizons.

Surface sediments have already been analyzed for the bonding-environment of P and Fe species; in addition organic matter and anthropogenic contaminant contents (e.g., Hg), were analyzed in selected cores, too. It was found, that some of the surface sediments are intensively mixed which is shown by vertical trace metal profiles.

The relative abundance of different phosphorous species (e.g., apatite-bound, Fe-Al bound, Fe-bound, adsorbed and organic/residual bound) in the surface sediments changes vertically and spatially along a NE-SW profile through the Beibu Gulf. Apatite-bound P dominates in a number of sediments, with minor fractions related to adsorbed or Fe-bound fractions. This partitioning reflects the retention potential of the sediments for the nutrient and the impact by early diagenetic processes.