

Hydrothermal Fluids at the Mid-Atlantic Ridge (15°N and 4-11°S) as Media for the Transport of Energy and Mass from the Crust into the Hydro- and Biosphere

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The proposed work focusses on the role of hydrothermal fluids for the transport of material and energy from the oceanic crust into the oceanic water column, into the biosphere, and into the mineralic level. It is a continuation of the work during the first two parts of the SPP. Time series studies on fluid geochemistry will have more focus on the southern MAR areas this time, because previous data indicate the unique role of the newly discovered posteruptive systems where we measured the highest fluid temperatures ever found so far. The comparison of the ultramafic Logatchev field and the basaltic 5°S system allow for an estimation of the respective roles for element transport by these two system types. Participation in four further research cruises will provide us with the respective samples for the characterization of the inorganic and organic fluid geochemistry, different chemical species in the fluids and their role for geo-bio interfaces. Furthermore, boiling and phase separation in the fluids and the characterization of the super-hot (464°C) supercritical vapor phase in the fluids at 5°S will be investigated. Geochemical mapping of hydrothermal plumes will be supported by numerical modeling of heat and element fluxes from the vents into the oceanic water column.