



Tidal flow affecting plume dispersal at the Nibelungen Field, Southern MAR (8° S)

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Combined velocity/hydrography measurements have been carried out during Meteor Cruise M62/5 in November/December 2004 at the Southern Mid-Atlantic Ridge (MAR). At 8° 16' S 13° 32' W evidence of hydrothermal activity has been reported, which originates from the "Nibelungen Field" at "Cheating Bay". The hydrothermal signal, however, vanished during the measurement campaign, which is attributed to the strong temporal and spatial variability of the flow field in the rift valley.

Temporal variation is due to prevailing semi-diurnal tides and shows typical amplitudes of 5 cm/s, while spatial variability has its origin in the complex topography: The flow is enclosed by the rift valley, which is curved due to an offset in the spreading axis. During flood tide, flow is in northeastward direction in the density range of the hydrothermal anomaly and decreases with depth, until no well defined direction can be determined close to the bottom. During ebb tide, a weak flow in southwestward direction is found near the bottom, while no well defined direction can be given at plume density range.

With amplitudes of 5 cm/s tides have a typical path length of 1 km. As a consequence, a shift of the hydrothermal signal by 1 km within one tidal phase must be taken into consideration during the study of plume dispersal.