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Hydrothermal ^{3}He in the near field of natural CO_2 seeps in the Okinawa Trough

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The Okinawa Trough back-arc basin in the west Pacific Ocean is one of the two known hydrothermally active areas where venting of liquid CO_2 has been observed.
During the RV Sonne cruise So196 in March 2008 two hydrothermal vent fields in the southern Okinawa Trough were investigated: Hatoma Knoll and Yonaguni Knoll IV. Data were collected to characterize the dispersal of the plume in the water column. The data set consists of CTD casts with additional sensors for oxygen, turbidity and pH as well as velocity measurements with a lowered acoustic Doppler current profiler (LADCP) and water samples to analyze helium isotopes.

The dispersal of the plumes in the two regions is analyzed using primordial ^{3}He as a conservative tracer. The non-buoyant plume over the caldera of Hatoma Knoll was sampled as well as a buoyant plume which was still in the process of rising. Using the rise height of the plume and the background stratification, the heat flux of the two vent fields is estimated.
Furthermore the relation between the measured decrease of pH and ^{3}He in the plume is analyzed. Here, first results show a good linear correlation at the Hatoma Knoll vent field.