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The structure of the plume at the Mid Atlantic Ridge above the Logatchev Hydrothermal Field

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A series of 34 temperature, turbidity and CTD measurements and a 12 hours stationary survey were conducted at 14˚ 45' N in the water column above the Mid Atlantic Ridge in the Logatchev Hydrothermal Area. The aim of these measurements, jointly with chemical analyses, was to assess geometry and character of the hydrothermal plume originated from the Logatchev Hydrothermal Field.

We found the turbidity field to be elongated in NW-SE direction and seem to be split into two parts the LHF (Logatchev Hydrothermal Field) and the NZ (Northern Zone). This observed splitting might come from temporal or continuous clear water contour currents, blowing away the local water column. Generally maximum turbidities are observed between 2700 m and 2900 m water depth, 150 m to 350 m above known hydrothermal sources from black smokers in the LHF.

Internal waves with depth dependent amplitude of up to 175 m height are recognized, enhancing the mixing between layers. Additionally the time dependency of these waves blurs the recognition of the plume's geometry by means of singular CTD measurements.

Close to the sea floor small isolated hydrothermal warm water bodies were identified. Mixing with surrounding sea water dilutes these bubbles approximately by factor 4 during a rise between 55 m to 225 m above the sea floor. Later on the rising bubbles blur into each other and become inseparable.

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