



Seismic Reflections Within the Water Column South of South Africa: Indications for the Agulhas Retroflexion

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With the publication of Holbrook et al. (2003) the field of seismic oceanography experienced a major momentum. Several authors since then (Nandi et al., 2004; Holbrook and Fer, 2005; Paramo and Holbrook, 2005) could show that those reflections within the water column correspond to thin layers with strong vertical temperature gradients. Those reflections hence represent a chance to trace those temperature gradients over large distances.

Weak seismic reflections within the water column south of South Africa gave rise to the question whether here traces of the Agulhas Current or Agulhas Retroflexion can be observed. A careful reprocessing of the data led to the imaging of fields of reflections pointing towards a 135 km broad and about 1000 m deep reaching well stratified area with strong reflection amplitudes and several weaker reflections extending down to at least 1500 m water depth over the whole area of investigation.

To image both the boundaries between the water masses as reflections and the different properties of the long wavelength velocity variations in depth special imaging techniques like prestack depth migration analysis were performed. Further, the temperature gradients from the short wavelength properties as velocity and density contrasts were determined by a two step inversion of acoustic amplitude versus angle analysis to better quantify the variations of the water masses of the Agulhas Current.

References:

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