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New insights into the crustal structure of northern Germany

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In this paper we present reprocessing results of seismic reflection data sets recently released by the industry. The aim of the reprocessing was to study the influence of deep rooted processes on formation and evolution of the North German Basin and their relation to neo-tectonic activities by interpretation of lower crustal seismic events. The new seismic images were obtained by application of the Common Reflection Surface (CRS) stack method to the data. The CRS stack method (Müller et al., 1998) has already been successfully applied to reflection data from sedimentary basins (Trappe et al., 2001; Menyoli and Hübscher, 2004), but yet it has not been used to investigate the crystalline crust and deeper structures.

In the reprocessed sections the image quality of the lower and middle crust and the visibility of the Moho could be significantly improved. The latter appears as a flat boundary lacking the typical features of basin formation and graben developments. The observed flat Moho is in conflict with the currently supported extension model of the Glückstadt Graben. However, the flat Moho topography would be in good agreement with the observations of the DEKORP profiles (DEKORP-BASIN Research Group, 1999), located in the eastern part of the North German Basin. A similar observation is also reported by Maystrenko et al. (2003) for the reflection line in the Dniepr-Donets basin, Ukraine. Also, recent gravity modeling by Bayer et al. (2005) show consistent results. This real data example shows that the CRS stack method provides a promising tool for processing of not only subsurface structures, but also for imaging of crustal and subcrustal features.

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