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# Correlation of basement structures and sedimentary basin tectonics - results from the CORTEC project.

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The results presented here were elaborated under the umbrella of the German Priority program “Dynamics of sedimentary systems under varying stress conditions by example of the Central European Basin System". The integrated research aims in the correlation of crystalline basement structures with basin structures of younger epochs and surface topography. This includes the deduction of the subsidence history and the identification of seismo-stratigraphic units for selected areas in the southern North Sea and the investigation of deep-seated fault zones in the development of the North Sea basin. Additionally our research focuses on the role they play in the evolution of this part of the NWGB and the interaction with younger strata. In the seismic data, fault zones and zones of crustal weakness find their expression in salt tectonics, lineaments, (delta) fans, and pathways of fluid or gas migration. 3D gravity stripping as part of field signal separation eliminates the gravity effect of sedimentary basin structures and to draw a gravity picture at the Zechstein horizon which contains gravity effects of underlying pre-Zechstein formations. 3D potential field modelling and 3D visualization of the rather complicated and complex structures and processes which formed this part of the basin through time and space is performed via an exclusively developed databank system which does not only ease the interplay between the modelling programs but also the exchange of datasets across the disciplines involved in this research.

The interpretational results of data processing and modelling presented here base on several datasets from earlier seismic, gravity and borehole data acquisition. The datasets contain of different quality and volume. The were provided by several na-

tional and international project partners which is acknowledged: TGS NOPEC, Oslo (approx. 3500 km high resolution reflection seismic data), BSH, Hamburg (approx. 15000 gravity point data), KMS, Copenhagen (gravity data grid, 2´ x 2´), GETECH, University of Leeds (gravity data grid, 8 km x 6 km), DGMK, Hamburg (boreholes Southern North Sea), Intergovernmental Oceanographic Commission of BODC (bathymetry). The necessary geological information for model constraints was taken from the "Geotektonischer Atlas" and the "Ziegler Atlas".

We identified in the seismic database horizons that correspond to the base Middle Miocene, base Oligocene, base Eocene, base Tertiary, base Upper Cretaceous, Top Zechstein, and base Zechstein. 6 seismic horizons were imported into the 3D density model together with the available borehole information. Model densities base on both literature and velocity - density conversion. Density model, borehole information fit remarkable well into the depth migrated seismic horizons; the compilation of thickness maps leads to an important project task. Power spectrum analysis of the gravity field, caused by mass distributions in the crust, led to maximum depths of causing lithospheric structures. The depth solutions for specific anomalies are varying between $\sim$2km and $\sim$18km. To prepare the model geometry also curvature analysis applied to gridded Bouguer anomalies shows surface attributes that are representing and providing information on local bending. Especially the Horn Graben and the southeastern Central Graben are delineated by areas of maximum curvature. These features follow mostly NW and NE striking structures in the NWG basin. In the some of the seismic sections, several salt diapirs feature the complex internal structure which elucidates several kinematical phases of dome evolution during the younger evolution of the basin.

This project overview will be accompanied by the presentation of three posters in that session (Schlesinger et al., Hese et al., and Arndt et al.).