



Basin-Scale Basement Control of the Evolution of the Mid-Polish Trough

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Mid-Polish Trough (MPT) was intracontinental sedimentary basin that formed SE axial part of the Danish - Polish Basin. MPT developed from Permian to Cretaceous times along the Tornquist - Teisseyre Zone which marks boundary between East European Craton (EEC) and Palaeozoic Europe. It was filled with several kilometres of siliciclastics and carbonates with thick Zechstein evaporities. Within the Rotliegendes sandstones numerous hydrocarbon accumulations occur. Basement tectonic activity during MPT's extension and inversion within the axial part of the basin characterised by thickest evaporitic complex was significantly filtered by thick Permian evaporates what led to decoupled evolution of the Triassic - Cretaceous post-salt infill. Basin edges, characterized by either thin or lack of evaporates show direct relationship between basement and cover tectonic processes. Styles of deformation identified using seismic data include inversion-related structures like reverse faults and uplifted basement blocks. Hangingwalls of faults systems are characterized by extension-related increased thickness of the Zechstein - Triassic - Jurassic - Lower Cretaceous deposits and by inversion-related thickness reductions of the Upper Cretaceous deposits. Regional analysis of sedimentary patterns within the Mesozoic infill, morphology of the pre-Zechstein basement and distribution of the salt structures allowed for identification of potential sub-Zechstein basement fault zones responsible for MPT's extension and inversion. Its NE edge was controlled by the generally linear SW boundary of the EEC, while its SW edge was controlled by complex system of en-echelon faults. These faults could directly control regional distribution of hydrocarbon accumulations within the lower Permian (Rotliegendes) siliciclastic succession.