Seismic Multi-Attribute Analysis of Deep-Water Sediments – Towards a Stratigraphic Exploration Model for the Palaeocene-Eocene on the Southern West Greenland Margin

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ABSTRACT

The southern West Greenland margin from Disko Island in the north to Cap Farewell in the south, an area encompassing more than 1200 km by 250 km, features large structures and deep rifted sedimentary basins, some of which have been drilled within the last decade. Many of these wells failed to penetrate thick reservoir sections in the Palaeocene-Eocene interval and reservoir presence is considered a key risk in exploring the Palaeocene-Eocene interval on the margin. Our regional mapping has shown that within the Palaeocene-Eocene time interval, three unconformities can be mapped over large parts of the study area - a basic Tertiary unconformity and two unconformities within the Eocene. In our analysis we have applied both structural attribute types (discontinuity, shaded relief, dip and azimuth, curvature and amplitude change) in combination with attributes which relate more to stratigraphy of the seismic package (reflection strength, average frequency, response phase, acoustic impedance and parallelism) on 3D seismic data in combination with regional 2D seismic data sets correlated to geophysical log data from exploration wells, improves the understanding of the structural settings which controls the distribution of potential reservoir sections and their facies variation. The mapping has shown that the Late Palaeocene-Early Eocene and Mid Eocene unconformities are important events that control the structural settings and mechanisms for the distribution of potential reservoir sections. Potential reservoir sections are likely found along the footwall of some of the large structures, which has been eroded during the Late Palaeocene-Early Eocene and Mid Eocene uplift events. The presented work is part of a larger project in defining and formulating a robust stratigraphic exploration model for the Palaeocene-Eocene on the southern West Greenland margin.