



Full 3D structure, tectonic development and modelling of the Svartenhuk inner-SDR wedge (Greenland): a model to explain syn-magmatic break-up processes in the NE-Atlantic

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The Svartenhuk Peninsula is the onshore exposure of the SE Baffin Bay volcanic margin (W-Greenland). This volcanic margin is conjugate to the Eastern Baffin Island volcanic margin and formed during Late Paleocene/Early Eocene break-up between NAM and Greenland north of the Davis Strait transform. The Svartenhuk Peninsula represents the unique SDR prism in the world that is completely in offshore location due, notably, to Tertiary uplift. As such, it is of prime importance to stress its structure and tectonic development in order to better understand the structure of offshore SDR prisms located elsewhere and, notably, in the NE-Atlantic. We confirm from a detailed 3D reconstruction of the bottom surface of the upper lava formations that this SDR prism (up to 6 km in thickness) developed as a roll-over flexure controlled by a large continentward-dipping detachment fault (Arfertuarssuk Fault). It is noteworthy that the southern part of the volcanic prism was bulged during its development. Using a set of $\sim 10^3$ faults with precise geometry (including slip-vectors) as well as mode-I magma fractures, we establish the tectonic setting of the SDR flexure. We discuss the origin of the SDR i.e. its gravity versus tectonic origin as well as the stress regimes during its development. Finally we present FEM numerical modelling of SDR development at volcanic margins and compare these results to the natural model.