



## Magmatic development of the outer Vøring Margin

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The Vøring Plateau off mid-Norway is a volcanic passive margin, located north of the East Jan Mayen Fracture Zone (EJMFZ). Large volumes of magmatic rocks were emplaced during Early Eocene margin formation. In 2003, an ocean bottom seismometer survey was acquired on the Vøring and Lofoten margins. One profile crosses from the Vøring Plateau to the Vøring Spur, an oceanic plateau north of the EJMFZ. The P-wave data were modeled by ray-tracing in a 2D velocity model of the crust. The process behind the excess magmatism can be estimated by comparing seismic velocity ( $V_P$ ) with igneous thickness (H). This profile and two other profiles farther north show a positive H- $V_P$  correlation, consistent with a hot mantle reservoir of finite extent under the margin at breakup. However, during the first two million years, magma production appears to be augmented by a secondary process. By 51-51.5 Ma melting may be caused by elevated mantle temperature alone. Seismic stratigraphy around the Vøring Spur shows at least two inversion events, with the main episode tentatively in the Upper Miocene, apparently through igneous growth to create the up to 15 km crustal thickness. The H- $V_P$  correlation of the spur is low, indicating constant and moderate-degree mantle melting not tied to the breakup magmatism. The admittance function between bathymetry and free-air gravity shows that the high is near local isostatic equilibrium, discounting that compressional flexure at the EJMFZ shaped the high. We also find no evidence for the proposed Early Eocene triple junction in the area.