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2D and 3D wide-angle imaging in the southern Vøring Basin using OBS-data

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The dominantly passive volcanic Vøring and Møre margins, NE Atlantic, are separated by the 200 km long Vøring Transform Margin (VTM). The southern Vøring Basin and the VTM have been studied by use of four regional 2D Ocean Bottom Seismograph (OBS) profiles, combined by gravity modelling. Three of the profiles crossed in the Rån Ridge area, and simultaneous recording along all profiles allowed coarse 3D modelling to be performed. The modelling revealed the presence of an up to 10 km thick pre-Cretaceous sedimentary succession northeastward of the Jan Mayen Fracture Zone. It is suggested that this basin is genetically related to the NS-trending Late Paleozoic and Mesozoic rift basins in North-East Greenland. An 8+ km/s layer is observed in the lower crust beneath the Rån Ridge, and it is argued that the body most likely consists of partially eclogitized rocks. The lower crustal 8+ km/s body is bounded by the Jan Mayen Fracture Zone to the southwest and Lineament L (derived from OBS data) to the northeast. A lower crustal 7+ km/t layer northeast of Lineament L is interpreted as a mixture of Late Cretaceous - Early Tertiary mafic intrusions and older continental blocks. The crustal models demonstrate a complex pattern of magmatism along the Vøring Transform Margin. The distribution of magmatism seems to be related to the existence and trend of the lower crustal 8+ km/s body. Magmatic 'leakage' across the Continent-Ocean-Transition appears to be facilitated when this layer is absent. It is proposed that partly eclogitized rocks were uplifted close to a Caledonian zone of weakness during the collapse of the Caledonides, and that this body acted as a barrier to transform margin magma emplacement during the Late Cretaceous - Early Eocene phase of rifting/break-up and early phase of sea-floor spreading. We specu-

late that the presence of the eclogitized body caused the observed right-stepping of the left-lateral shear zone at the northwestern transform margin segment, leading to increased lithospheric thinning and increased break-up magmatism there. Lineament L is interpreted as a structurally active, lithological boundary during the Paleozoic extensional episodes, but it appears to have been structurally inactive during the Late Cretaceous - Early Eocene rifting. The oceanic crust formed southwestward of the transform margin has the typical thickness of crust generated at very slow spreading ridges.