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Characterization and timing of magmatic intrusions in Stappen High area as derived from state-of-the-art aeromagnetic and seismic data

Marie-Andrée Dumais (1,2), Marco Brönner (1,2), Kamaldeen O. Omosanya (2), Ståle E. Johansen (2), and Morten Smelror (1)

(1) Geological Survey of Norway, Trondheim, Norway, (2) Department of Geoscience and Petroleum, Norwegian University of Science and Technology, Trondheim, Norway

The Vestbakken Volcanic Province (VVP) in SW Barents Sea has undergone several episodes of magmatic activity during the Cenozoic. Three phases of magmatic intrusions have been previously proposed for the study area. However, the age of the phases is still discussed. This work further investigates and evaluates the timing of magmatic intrusions in the context of earlier works undertaken in the area. We have used a combined approach including the use of seismic interpretation and high-resolution aeromagnetic data to quantify the magnetic properties of the sills interpreted west of the Stappen High. Remanent magnetization of the sills was estimated from forward modelling and provides an indication of the timing of magmatic intrusions into the host sedimentary rocks. Two-dimensional seismic reflection and gravity data constrain both the structural and crustal components along with the shape and volume of the sills. In addition, remanent magnetization parameters such as magnitude, inclination and declination are established from the magnetic data. Our preliminary results have provided more insights on the role and process of magmatic emplacement during continental breakup, which have implications for ongoing hydrocarbon exploration in the study area and in the conjugate margin.