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Inside the basement structure of northern Norway: an integrated onshore-offshore study

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For the Troms area in northern Norway, an integrated study is carried out with the aim to improve the understanding of the existing basement structures. Since decades the Caledonian thrust belt and extensional detachments along the western margin of the Finnoscandian shield have been objects of extensive sciences. The distribution of the Precambrian and Caledonian basements onshore is well defined, although the complex character of this collision zone and the ongoing uplift of the shield still give room for controversial discussions concerning the crustal structure. However, the basement structure offshore Norway is less well defined. Only during the last few years integrated 3D studies from Mid-Norway and Nordland area up to Troms have attempted to bridge the gap between the onshore and offshore geology. They could reveal a coherent picture of the basement and contributed a better understanding of the geotectonic settings. Further to the north for the Finnmark area and the Barents Sea recent publications support a northward extension of the Caledonian basement northwards to Svalbard and aimed at mapping the transition of Caledonian and Precambrian basement as the collision's suture zone. From gravity and magnetic maps of the Troms area in between these regions a significant change of the main tectonic elements and geodynamics is indicated. Here at the narrowest part of the Norwegian shelf a major change in striking of the main elements from SW-NE to N-S seems to take place. With the aim to achieve an understanding of these structures and to provide a better inside of the basement settings an integrated onshore-offshore study was performed in an area extending from Vesterålen to western Finnmark. The study is based on gravity and high-resolution aeromagnetic data. Potential field data and in particular newly acquired high-resolution aeromagnetic data are beneficial to map different structural

elements and tectonic settings. Additional lithological and structural information from well logs, rock sampling and from selected seismic profiles were utilized to constrain the interpretation. Apart from a detailed interpretation of the potential field data, the results of 2D modelling of some key lines within the area are presented as well as intermediate results of an ongoing 3D modelling.