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A detailed geophysical and geological study of Møre-Trøndelag Fault Complex (MTFC), Mid Norway

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The Møre-Trøndelag Fault Complex (MTFC) is one of the most prominent fault complexes in Scandinavia and perhaps on Earth. The MTFC appears to have controlled the tectonic evolution of central Norway and its shelf for the past 400 Myr, at least, and has experienced repeated reactivation during Paleozoic (Devonian to Permian), Mesozoic (Jurassic) and, perhaps, Cenozoic times. Geological and geophysical observations demonstrate that the MTFC exerted a strong control in shaping the basins offshore but also in influencing the development of the landscape onshore, and continues today in modifying the regional stress pattern. In this study we present a tentative interpretation of the MTFC at both regional and local scales. Regional gravity and aeromagnetic data were used for mapping the MTFC whereas new and multidisciplinary geophysical data sets such as 2D resistivity, gravity, magnetic and seismic profiles helped to characterize the fault zone in much finer detail. The obtained geophysical models were calibrated by means of rock sampling and petrophysical measurements of density, magnetic susceptibility and seismic velocity. As a final research effort, we set up series of rheological models for the MTFC using 3D numerical techniques. The final product of the study will be a numerical/rheological model that will be used to simulate the potential influence of the MTFC on the tectonic evolution of the region through time.