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Spatial and temporal reconstruction of the Norwegian-Greenland Sea: insights from the Jan Mayen system

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Complex rifted margin formation that involves multiple rifting, seafloor spreading, relocation of plate boundaries and microcontinent formation is not well understood. The Jan Mayen microcontinent (JMMC) in the Norwegian-Greenland Sea is a classical example of microcontinent, but its complex structure and evolution have not been studied in detail so far. We have revised its basement and sedimentary geometries using seismic reflection profiles, and potential field data. Our interpretation suggests that the JMMC structure is more complex than the two main blocks described so far in the literature (the Main Ridge and the Southern Ridge Complex), and includes six distinct segments which evolved independently through different rifting phases. In this contribution we present a 4D model of the JMMC based on a wealth of geophysical data. New detailed aeromagnetic data in the Norway Basin, together with results of balanced cross-sections through the JMMC and regional knowledge on kinematics were used to build a new model for the microcontinent formation. A seven stages schematic representation of the temporal and spatial evolution of the JMMC in the Norwegian-Greenland Sea context is proposed and discussed, from the first increments of rifting-related extensional deformation (late Paleozoic time) to the oceanic spreading activity at the Kolbeinsey Ridge (C6B, Early Miocene time).