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The Beiarn Nappe Complex: a record of Laurentian Early Silurian arc magmatism in the Uppermost Allochthon, Scandinavian Caledonides

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Geochemical, geochronological and isotopic studies have been carried out on a suite of compositionally different igneous rocks intruding amphibolite grade schists and marbles of the Beiarn Nappe Complex to better understand the pre-collisional position and evolution of an exotic continental terrane within the Scandinavian Caledonides. Major and trace element data on bulk samples combined with U-Pb ID-TIMS and Lu-Hf solution-ICP-MS data on zircons from 8 plutons indicate that the magmatic rocks of the Beiarn Nappe Complex formed in a continental margin arc setting between 434 Ma and 428 Ma, and are characterized by a range of εHf(t)-values between +5.8 (for mafic intrusives) to -5.3 (for granites). These rocks do not have the Early Ordovician magmatic signature (470-450 Ma) observed in the Helgeland Nappe Complex further to the south, but the Silurian pulse of magmatism in the Beiarn Nappe Complex seems to correspond to Silurian magmatism in the eastern part of the Helgeland Nappe Complex. The Helgeland Nappe Complex has been linked to the Scottish segment of Laurentia‘s eastern margin. The Beiarn Nappe Complex is in terms of age correlative to Silurian magmatic rocks in NE Greenland. A correlation between the Beiarn Nappe Complex and the Hurry Inlet plutonic terrane in Liverpool Land, NE Greenland is supported by a similar range of εHf(t)-values for the two magmatic complexes, also indicating that the magmatic rocks had a mixed juvenile mantle and crustal source, the latter with crustal residence time of minimum 1.75 Ga.