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The origin and evolution of the Ketilidian Orogen in South Greenland; zircon U-Pb geochronology and O-Hf constraints on magmatic sources within a Paleoproterozoic arc

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The Paleoproterozoic Ketilidian Orogen in South Greenland (1.85-1.73 Ga) is interpreted to be the result of northwards-dipping oblique subduction of an oceanic plate beneath the Archaean continental crust of the North Atlantic Craton. The Ketilidian Orogen is part of the subducted-related magmatism and accretionary orogenic belt named the Great Paleoproterozoic Accretionary Orogen that existed along an active margin stretching through Laurentia (North America and South Greenland) to Baltica (Northeast Europe), which was part of the formation of the supercontinent Columbia/Nuna. Thus, the orogeny represents part of an important episode of crustal growth and preservation in Earth's history. The Central Domain of the orogeny is dominated by the plutonic remnants of a magmatic arc (the Julianehåb Igneous Complex (JIC), ca. 1.85-1.80 Ga), which in time grew sufficiently large and stable to subsequently uplift and unroof, to generate rocks interpreted to represent erosional fore-arc deposits that are preserved to the south in the Southern Domain. Between ca. 1.80 Ga and 1.76 Ga, the fore-arc underwent metamorphism at amphibolite to granulite facies conditions, and subsequently was intruded by post-tectonic granites (including rapakivi variants) of the Ilua Suite (1.75-1.73 Ga). We present new zircon U-Pb SIMS ages for granitic and metasedimentary rocks sampled at a regional scale in a traverse stretching NW to SW through the Central and Southern Domains of the Ketilidian Orogen in South Greenland. The U-Pb results are part of an ongoing larger investigation including O-Hf isotope compositions in zircon analysed by SIMS and LA-MC-ICPMS respectively, combined with whole rock geochemical and isotope data. We intend to present the combined results of the zircon U-Pb-O-Hf work. Previous studies have suggested the arc is juvenile based on limited data; we will present Hf-O isotope data that test this hypothesis. This study will provide the first thorough geochemical and petrogenetic investigation of the timing, across arc variations, and source components involved in the formation and evolution of South Greenland as well as evaluate its contribution to one of the worldwide peaks of continental crustal growth.