



Detrital zircon age signatures of Precambrian metasediments from southern Wedel Jarlsberg Land and Sørkapp Land (Spitsbergen) defining a major tectonic boundary within the Southwestern Svalbard's Caledonian Basement Province

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Here we present SIMS and LAICPMS U-Pb geochronology for detrital zircon grains from metasedimentary rocks of southern Wedel Jarlsberg Land (WJL) and Sørkapp Land in the southwestern Svalbard's Caledonian Basement Province. The data for the Gulliksenfjellet Formation are characterized by a lack of detrital ages < 1.72 Ga. The older zircon age signature is instead dominated by Paleoproterozoic (1.75, 1.9, 2.5 Ga) populations with a small Archean (3-3.1 Ga) component. The Eimfjellbreane and Skjerstranda formations of the Eimfjellet Complex are characterized by a maximum sedimentation age as young as the Neoproterozoic/Mesoproterozoic boundary (0.98-1.02 Ga). The dominant population is composed of early Mesoproterozoic to Paleoproterozoic ages of ca. 1.5 and 1.8 Ga with a minor Neoproterozoic presence (2.68 Ga). Tectonically lower, the Isbjørnhamna Group has similar detrital zircon age populations dominated by ca. 1.6 Ga ages and subordinate groups at 1.07, 1.2 and 1.7 Ga; no detrital zircons < 1.05 Ga are present. Detrital zircon age signatures of an unnamed unit of metasedimentary rocks in Sørkapp Land present an array stretching from populations of Early Neoproterozoic age to single Archean grains, an age distribution that is similar to the Isbjørnhamna Group: the largest age population at 1.69 Ga with minor peaks at ca. 1.1, 1.3, 1.85 and 2.4-2.5 Ga. The Deillega and Sofiebogen groups, exposed north of the Vimsodden-Kosibapasset Shear Zone (VKZ) are characterized by noticeably different detrital zircon age patterns. A Mesoproterozoic to early Paleoproterozoic (c. 1.44-1.62 Ga) population defines the largest component with a minor early Neoproterozoic (0.81-0.9 Ga) signatures and a distinct lack of Archean dates. The markedly different age distributions in samples that originate north and south of the VKZ suggest different sedimentary sources for the respective stratigraphic units and support the model that the VKZ is a major tectonic boundary separating two different terranes (Mazur et al. 2009). Our data suggest that the crystalline basement south of the VKZ consists of a remnant of the older late Paleoproterozoic to early Mesoproterozoic crust (Gulliksenfjellet Formation) and younger late Mesoproterozoic to early Neoproterozoic sediments (Eimfjellbreane and Skjerstranda formations, Isbjørnhamna Group and unnamed units of the Sørkapp Land), whereas sedimentary units north of the VKZ exhibit a slightly younger early Neoproterozoic maximum sedimentation age. This work is partially funded by NCN research project No. UMO-2015/17/B/ST10/03114 and AGH research grant 11.11.140.319. Mazur, Stanisław, et al. "A strike-slip terrane boundary in Wedel Jarlsberg Land, Svalbard, and its bearing on correlations of SW Spitsbergen with the Pearya terrane and Timanide belt." *Journal of the Geological Society* 166.3 (2009): 529-544.