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Late Neoproterozoic granulite facies metamorphism of the Upper Gneiss unit (Seve Nappe Complex) in the Váivančohkka-Salmmečohkat area, northern Scandinavian Caledonides

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Here, we present preliminary petrochronological results of paragneisses and schists containing bodies of metamafic rocks belonging the Upper Gneiss unit that occurs within the Seve Nappe Complex (SNC) in the Váivančohkka-Salmmečohkat area, north of the lake Torneträsk in northern Sweden and Norway.

At the outcrop scale, the paragneiss is pervasively foliated and bears features of migmatization. It hosts garnet amphibolite bodies that are locally transected by leucocratic veins. Thin section observations of the paragneiss reveal a mineral assemblage composed of Q+Grt+Amp+Bi±Pl±Ms±Sil±Ru. The leucocratic vein contains Q+Pl+Ms+Bi+Grt+Kfs±Sil. Importantly, some of the studied gneisses contain quartz, exhibiting lobate boundaries, as well as garnet surrounded by melt rim. The presence of quartz forming pseudomorphs after melt was also identified and observed to host both monophase and fluid inclusions. All of these microtextures are indicative of partial melting.

Preliminary pressure-temperature estimates derived using conventional geothermobarometry and phase equilibrium modelling corroborated petrographic observations. The peak metamorphic conditions were estimated to 8–10kbar and 800–850°C, i.e., in the stability field of melt.

Uranium-Pb zircon and Th-U-total Pb monazite dating of the migmatitic paragneiss yielded consistent age estimates of 602±5Ma and 599±3Ma, respectively. Nearly the same U-Pb age of 604±7Ma was obtained for the zircon from the leucocratic vein transecting the amphibolite within the studied gneiss. Interestingly, no Caledonian zircon nor monazite were identified. Considering the textural position of the dated zircon and monazite, as well as their chemical character, we suggest that these minerals date the partial melting event recorded by the rocks.

Regionally, we interpret that the Upper Gneiss unit of SNC in the Váivančohkka-Salmmečohkat area could be a northern continuation of the Leavasvággi gneiss associated with the Vassačoru Igneous Complex of SNC in the Kebnekaise region. Notably, the latter reveals evidence of high temperature metamorphism at c. 600Ma (Paulsson and Andréasson 2002) and its mafic

component (see also Rousku et al. in this session) could be an equivalent to the metamafic rocks enclosed within the Upper Gneiss unit. The Leavasvággi gneiss and the Upper Gneiss unit together with similar rocks farther north in Indre Troms and in Corrovare which also yield a c. 610-600Ma age of high grade overprint (Gee et al. 2016; Kjøl et al. 2019). Altogether, these areas with only localized Caledonian influence diverge from traditional models developed for the SNC farther south and offer an additional insight into the development of the late Neoproterozoic margin of Baltica at the early stages of Iapetus opening.

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