Precambrian high-P/T metamorphism, Gorny Altai, southern Russia: paleogeotherm in subduction zone and Earth　cooling history

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Precambrian High-P/T metabasites in Gorny Altai, southern Russia, belong to the high-P/T intermediate facies series, and the metamorphic conditions depict an anticlockwise P-T curve with a kinking point around the continental MOHO depth, resulting from subduction of young and hot lithosphere. The subducted materials would have been heated up by a hot lithosphere down to the MOHO depth, then the recrystallized unit would have been moreover dragged deeper down and heated by a counter flow in the mantle wedge. However in this case, the wedge mantle could not be effective as the heat source. Such a process is characteristic in the Precambrian Earth, with a younger average age of subducting plate and a thicker oceanic crust.

High-P/T metabasites in the Vendian-Cambrian orogenic belt, Gorny Altai, southern Russia, were examined to obtain information about paleogeotherm in subduction zone around Proterozoic-Phanerozoic boundary. The orogenic belt consists of island-arc volcanic rocks, a low-P type ophiolitic suite (LPO), a high-P/T metamorphic (HPM) slab, and a feebly metamorphosed accretionary complex (AC). The about 1 km thick HPM slab is in a fault contact with the overlying LPO and the underlying AC. The HPM slab is divided into two subunits; the eastern unit composed of serpentine schist with intercalations of eclogite, garnet-amphibolite, low-grade basic and calcareous schists, whereas the western unit of mainly basic schist with minor calcareous and siliceous schists. In the eastern unit, K-Ar ages of 535 Ma for amphibole in eclogite and 567-540 Ma for phengite in basic schist have been dated (Buslov & Watanabe, 1996). Metabasites in the eastern unit have been recrystallized under greenschist/blueschist (GS/BS) transition, ep