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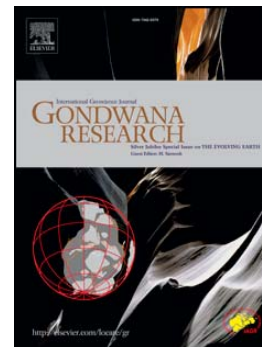
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Early Paleozoic polyphase metamorphism in northern Tibet, China

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Abstract The Altun–Qilian–Kunlun orogenic system in the northern Tibetan Plateau is considered as the northernmost orogenic collage of the proto-Tethyan domain. Early Paleozoic polyphase tectonothermal events related to the subduction of the proto-Tethyan ocean and subsequent collisional orogeny produced two dominant metamorphic belts: the North Altun (NAT)–North Qilian (NQL) HP/LT metamorphic belt, and south Altun (SAT)–north Qaidam (NQD) UHP metamorphic belt. The NAT–NQL HP/LT metamorphic belt mainly consists of blueschist, eclogite and HP metasediments. Eclogites record metamorphic conditions of 420–550 °C and 21–25 Kbar, at 510–460 Ma. The HP/LT metamorphic belt is associated with ophiolite, subduction-accretion complex, and arc magmatic rocks, suggesting that the NAT–NQL is a typical early Paleozoic accretionary orogenic belt. In contrast, the SAT–NQD UHP metamorphic belt is characterized by eclogite and garnet peridotite enclosed within continental orthogneiss and paragneiss. These rocks record UHP metamorphism at $T > 700$ °C and $P > 27$ Kbar. Geochronology suggests that the UHP metamorphism occurred at 500–423 Ma, and eclogite protolith ages of 850–750 Ma suggests protoliths are related to Neoproterozoic continental rifting. Field relationships, petrology and geochronology suggest that the SAT–NQD UHP metamorphic belt resulted from the deep subduction of continental crust. Moreover, in the SAT–NQD

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