U/Pb geochronology and Hf isotopic constraints on the evolution of Paleoproterozoic granitoids in northern Vietnam

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As a northern extremity of the Indochina block, the middle Paleoproterozoic Deo Khe granites (DKG) in the Phan Si Pan zone (PSPZ) of northern Vietnam is one of the oldest basement in the Indochina block. A suite of petrographic investigation, zircon U-Pb geochronology, and Hf-isotopic analysis were carried out. In particular, U-Pb zircon ages and Hf isotope data of middle Paleoproterozoic age in Vietnam is unprecedented, providing valuable first order constraint on the tectonic evolution of the Indochina block. Analysis of trace elements indicates that the DKG is enriched in large ion lithophile elements but is depleted in high field strength elements. It is likely that the DKG is a product of recycled Archean crustal rocks, possibly linked with the transition in tectonic setting from syn-collisional metamorphism to post-collisional magmatism during the assembly of Columbia supercontinent. Magmatic crystallization of DKG and emplacement of tonalite-trondhjemite-granodiorite (TTG) gneiss within the Phan Si Pan zone provide clues to the issue that the Yangtze block and the northern Indochina block might share a similar orogenic evolution path.