

Jurassic magmatism and accretionary complexes in the NE Asian continental margin: constraints for the evolution of the Paleo-Pacific Plate

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It is widely accepted that subduction of the Paleo-Pacific Plate beneath Eurasia began in the early Mesozoic. However, the history and process of Paleo-Pacific Plate subduction beneath Eurasian continent remain controversial. In this paper, zircon U–Pb–Hf, provenance, metamorphic deformation, and whole-rock geochemical data are used to constrain the formation of Jurassic accretionary complexes (AC) and tectonic setting of Jurassic igneous rocks in the NE Asian continental margin. The Jurassic AC underwent a complex evolution, including the formation of seamounts, Middle-Late Jurassic terrigenous clastic sedimentation adjacent to the trench, collision of seamounts with Eurasia, northward migration, early Early Cretaceous terrigenous clastic sedimentation, and final emplacement. Ages and Hf isotopic compositions of detrital zircon grains from Middle-Upper Jurassic and Cretaceous AC sandstones indicate that Jurassic clastic sediments were sourced mainly from the South China Block (SCB), whereas Lower Cretaceous sandstones were sourced from the eastern Central Asian Orogenic Belt (CAOB). The occurrence of early Mesozoic calc-alkaline igneous rocks along the NE Asian continental margin marks the initial subduction of the Paleo-Pacific Plate beneath Eurasia began in the Early Jurassic. Late Jurassic-early Early Cretaceous magmatism are lack in the NE Asian continental margin, except for minor adakites in the eastern NCC formed in compressional environment. The inferred northward migration of Jurassic AC (from 160 Ma-140 Ma) and minor Late Jurassic adakites indicates that the boundary between the NE Asian continental margin and the Paleo-Pacific Plate was characterized by strike-slip tectonics at this time, due to a small angle of obliquity in the subduction of the Paleo-Pacific Plate beneath Eurasia. In the late Early Cretaceous, westward subduction of the Paleo-Pacific Plate beneath Eurasia resulted in the final emplacement of the Raohe and Khabarovsk ACs.