Discovery of the relict of the Tsangpo foreland basins in Renbu tectonic mélange and its implication for the initial collision between India and Eurasian plates

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The existence and distribution of the peripheral foreland basins in the Yarlung-Tsangpo suture zone and Gandese zone remains controversial (DeCelles et a1., 2001; Najman, 2006). Recently, Ding et al. established the foreland basin systems in the Gandese-Himalayan collisional orogen belt (Ding et al., 2005, 2009), which recorded the course of the collision between Indian and Eurasian plates. Here we report the in-situ detrital zircon U-Pb and Hf isotopic analysis of sandstone rock from a sedimentary relict (including the siliceous rock, argillite, silty sandstone and coarse sandstone, from below), paraconformably covering the ophiolite relicts in the Renbu mélange belt, Dejilin town, Renbu County. Nine detrital zircon grains out of 54 grains have ages from ~83 to ~121Ma and three grains have ages of 197±3, 203±5 and 208±5Ma. The majority of these young zircons are characterized by high $^{176}Hf/^{177}Hf$ isotopic ratios and positive Hf(T) values that are similar to magmatic zircons from the Gangdese batholith, indicating the latter has been a predominant source provenance of the sedimentary relict. It's the first time to discover the Late Cretaceous deposition in this area. It may be a part of the foreland basin systems (Tsangpo peripheral foreland basin) in the Gandese-Himalayan collisional orogen belt, which plays a significant indicator of the initial collision between India and Eurasian plates.

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