

In-situ LA-ICP-MS U-Th-Pb monazite dating of metapelites from Namche Barwa area, Eastern Tibet

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The Namche Barwa Complex (NBC) in Eastern Tibet is an actively deforming metamorphic complex with an ambiguous tectonic and metamorphic history [1]. In order to better constrain the timing of metamorphism in this area, we apply in-situ LA-ICP-MS U-Th-Pb dating of monazite to metapelitic samples.

The dating result shows three groups of U-Th-Pb ages (Fig. 1): ~18-21 Ma, ~7.5-13 Ma and ~3.5-5.5 Ma. Except for one “sponge-like” grain, only these monazites in or related to garnet yielded the oldest group of ages. Monazite grains in matrix yielded the younger ages (<13 Ma) and no obvious evidence shows they can be classified according to the distinct crystal textures.

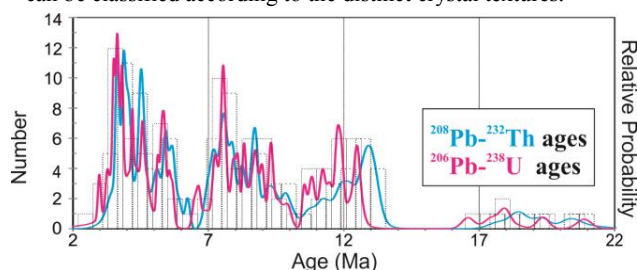


Figure 1: U-Th-Pb ages from monazite in thin sections

At present, our results suggest garnet growth associated with prograde metamorphism occur during ~21-18 Ma, which is younger than previous proposed peak metamorphism based zircon chronology (~40 Ma or ~20-25 Ma [2-4]). The younger age range (<13 Ma) is similar to those reported in [1] and likely related to anatexis and rapid exhumation. Whether our newly obtained ages represent different metamorphic episodes remains unclear and warrants further investigations, for example, the combined analyses of trace elements and the reconstruction of the *P-T-t* path for these metapelites using conventional geothermobarometry and thermodynamic modelling.

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[2] Ding, et al. (2001) *Earth Planet. Sci. Lett.* 192, 423-438 [3]
Su, et al. (2012) *Int. J. Earth Sci.* 101, 239-252. [4] Xu, et al. (2010). *Tectonophysics.* 485, 231-244.