



Detrital zircon U-Pb and Hf isotopic study of Eocene-Miocene sedimentary rocks, northern Taiwan: Implications for the source provenance and crustal evolution in SE China

WEN-YU SHAO, WEN-SHAN CHEN, and SUN-LIN CHUNG

Department of Geosciences, National Taiwan University, Taipei, Taiwan (f97224101@ntu.edu.tw)

U-Pb ages and Hf-isotope data of detrital zircons from Eocene-Miocene sedimentary rocks in the northern Taiwan were determined in order to delineate their provenance and crustal evolution in Southeastern China. The studied formations in northern Taiwan have been well reported as the Eocene formations in the Northern Cross-Island Highway and the Oligocene-Miocene formations in the northeastern coast area.

LA-ICPMS U-Pb results of zircon indicate that the Eocene sandstones from the Hsitsun and Szuleng formations display age patterns with main peaks at ca. 200-100 Ma and 540-250 Ma. Meanwhile, the Oligocene (Wuchihshan Fm.)-Late Miocene sandstones (Tapu Fm.) show main peaks at ca. 2.0-1.8 Ga and 2.6-2.4 Ga (account for 30-50%). The Late Miocene sandstone (Erhchiu Fm.), however, shows main peak at ca. 200-100 Ma.

In general, zircon ages from the Eocene formations indicate that the sources are dominantly derived from Yanshanian and Paleozoic granitic plutons in SE China, and with minor Paleoproterozoic components. On the contrary, zircon ages from the Oligocene to the Late Miocene formations indicate that the sources are dominantly Paleoproterozoic in age, hence we speculate that the sediments are very likely derived from Cathaysia basement exposed in the northwest Fujian and Zhejiang province, or alternatively the Precambrian metasedimentary rocks exposed in SE China. Nevertheless, in the Late Miocene, the resulted age spectra are similar to those from the Eocene formation, the similar patterns suggest that the sources have shifted back to Yanshanian plutons again. In addition, the Hf-isotope data suggest that the Paleoproterozoic populations were reworked from the Neoproterozoic sources; and the Phanerozoic populations were likely reworked from the Neoproterozoic sources. There is an evidence for the different juvenile crustal growth in Southeastern China.