

Improved Small-Volume U-Pb Zircon geochronology by LA-MC-ICPMS and application for metamorphic zircons

MENG LIN GUIBIN ZHANG* NAN LI

¹ Key Laboratory of Orogenic Belt and Crustal Evolution,
School of Earth and Space Science, Peking University,
Beijing 100871, China. gbzhang@pku.edu.cn

Accurate measurement of small volume (<0.5ng) U-Pb geochronology is significant for zircon grains with complex inner structure. We provide and evaluate a higher spatial resolution LA-MC-ICP-MS dating method using GeoLas HD laser ablation and Nu Plasma 2 mass spectrometer with spot diameter of 5 μ m (0.117 μ m per pulse) and 10 μ m (0.077 μ m per pulse). Overcoming the difficulty of downhole fractionation, this method is verified by investigating four zircon standards (91500, GJ-1, TEM, and PLE) with the precision for the weighted mean ²⁰⁶Pb/²³⁸U age within 1%. Using this technique, we have exactly applications in three UHT/UHP metamorphic samples with age range widely from 14Ma to 2000Ma. The zircons from these samples have tiny shapes, plentiful inclusions or complicated structures. The concordant age results demonstrate our zircon U-Pb dating method is credible and repeatable.