

## LA-ICP-MS U-Pb dating using non-polished zircons: Can we read magma residence time?

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It is well-known that in dating zircon by U-Pb method, LA-ICP-MS is inferior to TIMS in precision and to SIMS in spatial resolution. However, the LA-ICP-MS method usually drills zircons to  $\sim 20 \mu\text{m}$  in a single analysis ( $\sim 2 \mu\text{m}$  for SIMS). This can be an advantage over TIMS and SIMS in that it can obtain age information from the surface to the core of zircons. Especially, the method can elucidate zircon crystallization time from beginning to end by using non-polished zircons. Meanwhile it should be mentioned that in LA-ICP-MS  $^{206}\text{Pb}/^{238}\text{U}$  ratio increases as analysis time (as zircons are drilled deeper), known as down-hole fractionation. Here I took this into consideration and still found that the Fish Canyon Tuff, the largest known silicic eruption on Earth, has a magma residence time of more than 1 m.y., not less than 0.4 m.y. as assumed in literatures, and demonstrate the usefulness of non-polished zircon LA-ICP-MS U-Pb dating.

Keywords: U-Pb dating, zircon, LA-ICP-MS, magma residence time, Fish Canyon Tuff