DATA REPOSITORY FILES

Table 1.
Instrumental parameters of laser-ablation split-stream ICP-MS

	MC-ICP-MS	SC-ICP-MS
Instrument model	Nu Plasma HR	Nu AttoM
RF forward power	1300 W	1300 W
RF reflected power	<10 W	<10 W
Coolant gas	13 L/min	L/min 13
Auxiliary gas	0.8 L/min	0.8 L/min
Make up gas	~1.9 L/min - flow to AttoM	~1.9 L/min - flow to Plasma
Monitored masses	^{238}U, ^{232}Th, ^{208}Pb, ^{207}Pb, ^{206}Pb, ^{204}Pb/^{204}Hg	^{139}La, ^{140}Ce, ^{141}Pr, ^{146}Nd, ^{147}Sm, ^{153}Eu, ^{157}Gd, ^{159}Tb, ^{163}Dy, ^{165}Ho, ^{166}Er, ^{169}Tm, ^{172}Yb, ^{176}Lu, ^{179}Hf
Dwell time	200 ms	0.3 ms
Integration	0.2 s	0.5 s

	Laser-Ablation System
Instrument model	Photon Machines Analyte 193
Laser	ATLEX-SI 193nm ArF excimer
Energy	4 J
Repetition rate	4 Hz
Excavation rate	~0.1 um/pulse
Delay between analyses	30 s
Ablation duration	30 s
Carrier gas (He) flow	~0.25 L/min

File 1. The ablated aerosol is carried by He from the sample cell to a mixing bulb in which the sample + He are mixed with Ar to stabilize the aerosol input to the plasma. The He-Ar-aerosol is immediately split upon exiting the mixing bulb, with approximately half the ablation stream directed to each ICPMS. Laser energy is set to 4 mJ, which, once transmitted into the sample chamber, equates to ~0.1 μm/pulse; repetition rate is set to 4 Hz; single-ablation duration was 20–25 seconds, and spot sizes ranged from 24–30 μm.

U–Pb dates are obtained with the Nu Plasma, equipped with four low-mass side electron multipliers for simultaneous measurement of ^{208}Pb, ^{207}Pb, ^{206}Pb and ^{204}Pb; ^{238}U and ^{232}Th are measured on Faraday cups equipped with 10^{11} ohm resistors. The Nu AttoM is used in "E-Scan" mode to measure REE and Hf concentrations. Because standard analyses are matrix-matched (see below), an internal standardization is unnecessary. Sample analyses were preceded by a 10 second baseline measurement and unknown analyses were corrected with the 91500 zircon standard (Wiedenbeck et al. 1995) every five measurements (~5 min.). For quality control, the zircon standards GJ1 (601 Ma, Jackson et al., 2004) was run after each 91500 analysis, and yielded a ^{206}Pb/^{238}U age of 601 ± 2 (n = 129; MSWD = 1.5). Ternary standards were also run throughout the analytical sessions and yielded ages of 342 ± 2 Ma (Plešovice; n = 56; MSWD = 7.1) and 418 ± 3 Ma (R33; n=18; MSWD = 7).

File 2. Detrital zircons discussed in this paper were analyzed by LA-ICP-MS exclusively, but zircons from Mojave Desert Triassic plutons, against which we compare Th/U ratios of the samples discussed herein, were analysed by SHRIMP-RG (Barth and Wooden, 2006). Laser ablation pits in the ICP-MS method are 5-10 μm deep and 24 μm in diameter; those using the SHRIMP-RG method are 1-2 μm deep and 30 μm in diameter. This raises the possibility that in a very heterogeneous zircon, the two methods of analysis will yield different results, as the laser ablates a volume 5 to 10 times that of the ion microprobe and therefore has a higher probability of analyzing multiple compositional domains in the zircon. We are not aware of any systematic comparison of elemental analysis of the two methods, and so we present here (Fig. DR1) the results of analyses of two samples from the Los Tanques pluton in Sonora, Mexico, by each method. For this plot, only grains accepted by Isoplot (Ludwig, 2003) in the "Zircon Age Extractor" function were used. The similarity in results between the two methods is striking, and the greater variation in results from sample 022008-3 may be due to the systematics of zircons in that sample, as the variability is evident in both methods. We are investigating this issue further, but use these results to infer that to a first degree, comparing LA-ICP-MS results to ion microprobe analyses of zircons from Mojave Desert Triassic plutons is reasonable.

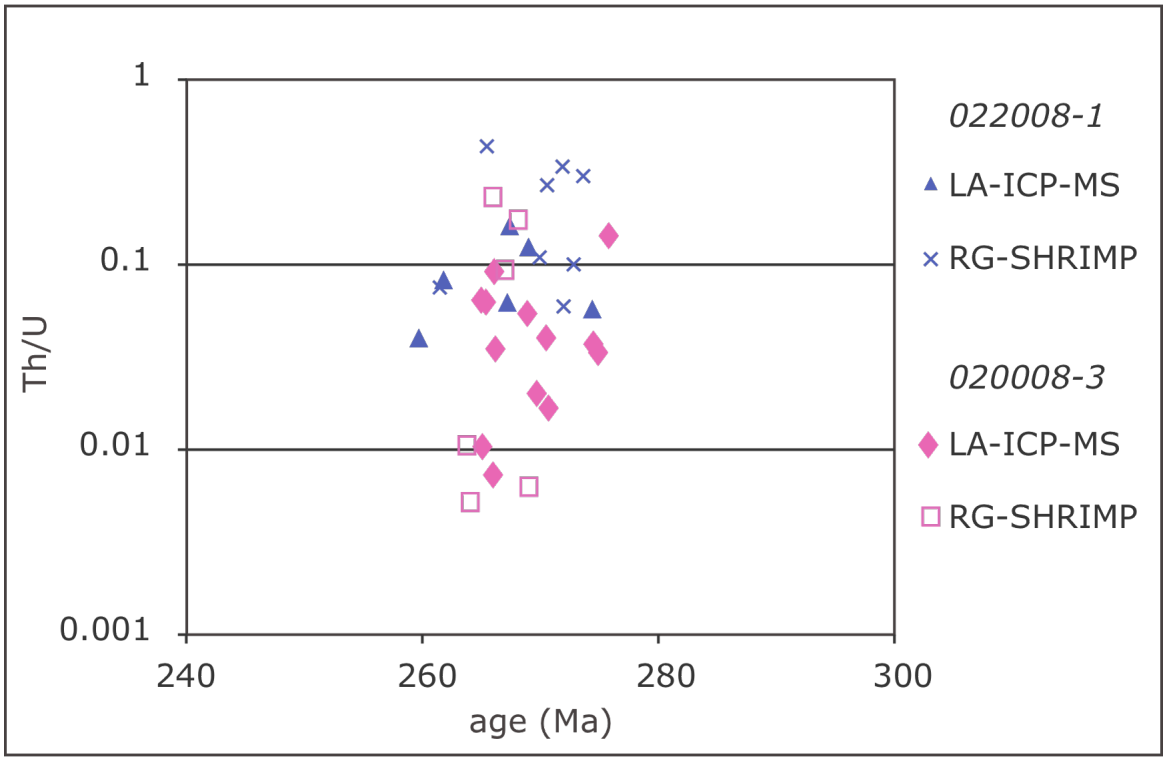

Fig. DR1. Age vs. Th/U comparison of Los Tanques granite, Sonora, Mexico, samples 02008-1 and 02008-3. Note overall similarity in values, especially in 020008-1.