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**Supplemental Material 2: LA-SF-ICP-MS, U-Th-Pb dating methods.**

Laboratory & Sample Preparation	
Laboratory name	Central Analytical Facilities, Stellenbosch University
Sample type / mineral	zircon grain mount
Sample preparation	SELFRAG (U. Pretoria) + conventional mineral separation, 2.5 cm resin mount, 1 $\mu\text{m}$ polish to finish
Imaging	CL, LEO 1430 VP, 10 nA, 15 mm working distance
Laser ablation system	
Make, Model and type	Resolution SE 193 nm Ar F ATL Excimer laser
Ablation cell and volume	Laurin Technic S155 dual-volume large format cell
Laser wavelength	193 nm
Pulse width	5 ns
Fluence	1.9 J/cm <sup>2</sup>
Repetition rate	9 Hz
Spot size	20 $\mu\text{m}$
Sampling mode / pattern	20 $\mu\text{m}$ single spot analyses
Cell carrier gas	100% He, Ar and N <sub>2</sub> make-up gases combined using injectors into sampling funnel
Pre-ablation laser warm-up (background collection)	3 cleaning shots followed by 20 s background collection
Ablation duration	15 s
Wash-out delay	15 s
Cell carrier gas flows	400 ml/min He
ICP-MS Instrument	
Make, Model and type	Thermo Finnigan Element2 single collector HR-SF-ICP-MS
Sample introduction	via 4mm ID Nylon tubing
RF power	1350 W
Make-up gas flow	910 ml/min Ar and 4 ml/min N <sub>2</sub>
Detection system	single-collector secondary electron multiplier
Masses measured	202, 204, 206, 207, 208, 232, 238
Integration time per peak	3 –15 ms
Total integration time per reading	0.9 s ( <i>represents the time resolution of the data</i> )
Sensitivity	30000 cps/ppm Pb
Dead time	6 ns
Data Processing	
Gas blank	10 seconds on-peak

Calibration strategy	GJ-1 zircon used as primary reference material, Plešovice zircon used as secondary reference material (quality control)
Reference Material info	GJ-1 (609 Ma; Jackson <i>et al.</i> , 2004); Plešovice (337 Ma; Sláma <i>et al.</i> , 2008)
Data processing package used / Correction for LIEF	lolite software for data normalization, uncertainty propagation and age calculation. LIEF correction assumes reference material and samples behave identically.
Mass discrimination	Standard-sample bracketing with $^{207}\text{Pb}/^{206}\text{Pb}$ and $^{206}\text{Pb}/^{238}\text{U}$ normalized to zircon reference material GJ-1.
Common-Pb correction, composition and uncertainty	not applicable
Uncertainty level and propagation	ages quoted at $2\sigma$ absolute, propagation by quadratic addition
Quality control / Validation	Plešovice: Concordia age = $338 \pm 2$ Ma ( $2\sigma$ , MSWD (C+E) = 0.81)
Other information	For detailed method description see Frei & Gerdes (2009)

## References

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