Data reporting template (metadata) for LA-ICP-MS U- Pb data

Laboratory & Sample Preparation	
Laboratory name	Dept. of Earth Science, University of Tasmania – CODES
Sample type/mineral	Zircon
Sample preparation	Conventional mineral separation, 1 inch resin mount, 0.3um alumina polish. Cleaned in DI H_2O degassed in vacuum.
Laser ablation system	
Make, Model & type	ASI Resolution S155-L and Resolution S155-SE
Ablation cell & volume	Two volume laser cell with a 8.8 cm^3 small 2nd volume fixed cup.
Laser wavelength (nm)	193nm for both systems
Pulse width (ns)	20ns for the S155-L and 5ns for the S155-SE
Fluence ($J.cm^{-2}$)	2.0 $J.cm^{-2}$ unless otherwise noted.
Repetition rate (Hz)	5Hz
Ablation duration (secs)	30secs
Ablation pit depth / ablation rate	8 to 10µm pit depth, optical interferometry, equivalent to 0.05-6 µm/pulse
Spot size (um)	29µm for the 20ns laser and 30µm for the 5ns laser.
Sampling mode / pattern	Static spot ablation
Carrier gas	100% He in the cell set to 0.35 l/min, Ar carrier gas combined in 2nd volume of laser cell and was set to 1.05 l/min.
ICP-MS Instrument	
Make, Model & type	Agilent 7900 ICP-MS for the 20ns laser and Agilent 7700 for the 5ns laser.
Sample introduction	Ablation aerosol mixed with argon and sent into ICP-MS
RF power (W)	1350W
Make-up gas flow (l/min)	0.0
Detection system	Electron multiplier with Pb and U in pulse counting mode
Masses measured	^{49}Ti, ^{56}Fe, ^{91}Zr, ^{178}Hf, ^{202}Hg, ^{204}Pb, ^{206}Pb, ^{207}Pb, ^{208}Pb, ^{232}Th, ^{235}U, and ^{238}U
Integration time per peak/dwell times (ms); quadrupole settling time between mass	2ms dwell time for ^{56}Fe, ^{91}Zr, & ^{178}Hf 10ms dwell for ^{49}Ti, ^{202}Hg, ^{208}Pb, ^{232}Th and ^{235}U 15ms dwell for ^{204}Pb & ^{238}U 25ms dwell for ^{206}Pb & ^{207}Pb.

jumps	
Total integration time per output	~180ms
'Sensitivity' as useful yield cps/ ppm	2,200 cps / ppm on ^{238}U in 91500 zircon using a 29 μm spot at 5Hz, 2J/cm2 and assuming ~80 ppm U in 91500. Total ablation is ~6275 cubic microns assuming at 9.5 micron crater depth
IC Dead time (ns)	37
Data Processing	
Gas blank	30 seconds
Calibration strategy	91500 used as primary reference material for Pb/U and Pb/Th ratios. NIST610 used for Pb isotope ratios ($^{207}Pb/^{206}Pb$) and trace element concentrations.
Reference Material info	91500 (Wiedenbeck et al 1995) NIST610 (Jochum etl a. 2011)
Data processing package used / Correction for LIEF	In-house macro based Excel workbook "zirccalc"
Mass discrimination	Corrected using standard - sample bracketing
Common-Pb correction, composition and uncertainty	Common Pb correction applied to Monastery, Mudtank, Penglai, SP07-05, and Qing Hu zircons using Stacey-Kramer's model Pb at age of zircon and 0.01 uncertainty (1 sigma absolute) common Pb composition.
Uncertainty level & propagation	Ages are quoted at 2sigma absolute, propagation is by quadratic addition of components of random error from unknowns and reference materials, uncertainty in drift corrections, etc. as described by Horstwood et al. 2016.
Quality control / Validation	See Table1.