Laboratory & Sample Preparation	
Laboratory name	Arctic Resource Lab, University of Alberta (Canada)
Sample type/mineral	Zircon grains (magmatic)
Sample preparation	Conventional mineral separation, polished 1inch resin mount
Imaging	CL & BSE (Zeiss EVO MA15) 15kv, 3-5 nA
Laser ablation system	
Make, Model & type	RESOlution ArF excimer
Ablation cell	Laurin Technic S-155
Laser wavelength	193 nm
Pulse width	4-20 ns
Fluence	*ca*. 6 J.cm^{-2} (120 mJ, 44% transmission)
Repetition rate	8 Hz
Ablation/Washout duration	45 secs / 45 secs
Ablation rate	0.125μm.pulse^{-1} with the *ca*. 6.5 J.cm^{-2} setting
Spot diameter	44 μm
Sampling mode / pattern	Static spot ablation
Carrier gas	100% He in the cell, Ar and N_2 make-up gas combined using a Y-piece 50% along the sample transport line to the torch.
Cell carrier gas flow	A mixture of 1.6-1.8 L/min Ar and 12-14ml/min N_2, which entered tangentially from the top of the S-155 ablation cell funnel and ~800 ml/min He entering from the side of the cell
ICP-MS Instruments	
U–Th–Pb measurements	
Make, Model & type	Thermo Fisher Scientific, Element XR, SC-SF-ICP-MS
Sample introduction	Ablation aerosol introduced through Tygon tubing
RF power	1360W
Detection system	202, 208, 232 in triple mode. 206 and 238 in analogue mode. 204 and 207 in counting mode 235 is calculated using canonical value. No Faraday cup used.
Masses measured	202, 204, 206, 207, 208, 232, 238
Integration time per peak/ dwell times	30 ms on 202, 204, 208 and 232; 60 ms on 206, 207 and 238
Total integration time	300 ms for each output datapoint
IC Dead time	20 ns
Data Processing	
Gas blank	30 second on-peak zero subtracted both for U-Pb and Lu-Hf measurements
Calibration strategy	91500 used as primary reference material (U-Pb), Plešovice, GJ-1, MUN1 & MUN-3 used as secondaries/validation materials.
Reference Material info	GJ-1 (Jackson et al., 2004; Morel et al., 2008) Plešovice (Sláma et al., 2008) MUN-1 and MUN-3 (Fisher et al., 2011) 91500 (Wiedenbeck et al., 1995; Wiedenbeck et al., 2004; Blichert-Toft, 2008)
Data processing package used / Correction for LIEF	Iolite software package (Paton et al., 2010; Paton et al., 2011; Fisher et al., 2017) using the following DRS: "U_Pb Geochron 4" for U–Th–Pb isotope analyses. LIEF correction assumes matrix match between reference material and samples.
Mass discrimination	Standard-sample bracketing with $^{207}Pb/^{206}Pb$ and $^{206}Pb/^{238}U$ normalized to primary reference material.

Common-Pb correction, composition and uncertainty	No common-Pb correction applied to the data
Uncertainty level & propagation	Ages are quoted at a coverage factor of 2, absolute. Propagation is by quadratic addition. Reproducibility and age uncertainty of reference material and common-Pb composition uncertainty are propagated where appropriate.