## Appendix A. Analytical Methods of LA-ICP-MS U/Pb zircon geochronology

Zircon crystals are extracted from samples by traditional methods of crushing and grinding, followed by separation with a Wilfley table, heavy liquids, and a Frantz magnetic separator. Samples are processed such that all zircons are retained in the final heavy mineral fraction. A split of these grains (generally 50-100 grains) are selected from the grains available and incorporated into a 1" epoxy mount together with fragments of our Sri Lanka standard zircon. The mounts are sanded down to a depth of ~20 microns, polished, imaged, and cleaned prior to isotopic analysis.

U-Pb geochronology of zircons was conducted by laser ablation multicollector inductively coupled plasma mass spectrometry (LA-MC-ICPMS) at the Arizona LaserChron Center (Gehrels et al., 2008). The analyses involve ablation of zircon with a Photon Machines Analyte G2 Excimer laser (or, prior to May 2011, a New Wave UP193HE Excimer laser) using a spot diameter of 30 microns. The ablated material is carried in helium into the plasma source of a Nu HR ICPMS, which is equipped with a flight tube of sufficient width that U, Th, and Pb isotopes are measured simultaneously. All measurements are made in static mode, using Faraday detectors with $3x10^{11}$ ohm resistors for $^{238}U$, $^{232}Th$, $^{208}Pb-^{206}Pb$, and discrete dynode ion counters for $^{204}Pb$ and $^{202}Hg$. Ion yields are ~0.8 mv per ppm. Each analysis consists of one 15-second integration on peaks with the laser off (for backgrounds), 15 one-second integrations with the laser firing, and a 30 second delay to purge the previous sample and prepare for the next analysis.

*Visualization Methods*

We have plotted detrital zircon age distributions of individual samples, multiple samples from single geologic units, and composite distributions for entire terranes (Fig. 4, 5) using probability density plots (PDPs) (Gehrels, 2000). In this method, a kernel is placed at each age measured from a single grain with its bandwidth determined by the standard deviation of the analyzed age (Sircombe and Hazelton, 2004). Although several objections have been raised to this estimation method (Sircombe and Hazelton, 2004; Vermeesch, 2012), it remains a useful and popular tool for visualizing detrital age distributions (Gehrels, 2014). Major and minor peaks present in the resulting distribution plots, created using an Excel macro written by G.E. Gehrels (2007), were identified through visual inspection.

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