

A Traceability Schematic for the Calibration of (EARTHTIME) U-Pb Isotope Dilution Geochronology

The schematic below is a graphical representation of the metrological traceability of U-Pb isotope dilution geochronology. It shows a series of calibration experiments (represented by the colour boxes) that are inter-linked (connections are illustrated as colour lines). Together, these experiments establish the traceability of U-Pb dates (box #6, upper right) to a series of SI units (box #0 at base of diagram). Within each of the coloured boxes, white boxes describe parameters measured by Condon et al. (in review) and McLean et al. (in review), detailing the materials being used/analysed and values used/determined for each parameter. The flow of information follows the connections, leaving an 'information box' at the top and entering the next

information box at its base. Note that as the calibration progresses, the traceability of both isotopic composition and assay determinations become mixed as the double spikes are used to correct for mass fractionation of the tracer-gravimetric mixes that are used to determine the concentration of the tracer isotopes. This schematic also includes information about the U decay constant measurements and their traceability via both direct counting and intercalibration experiments. See the grey-boxed annotations and Condon et al. (in review) and McLean et al. (in review) for further explanation and references. For documentation and a detailed discussion of the uncertainty propagation see McLean et al. (in review).

