

U-Pb zircon geochronological constraints on mylonitization in the Whipple Mountains

S1. Samples

Two samples, PW81 and PW82, were collected from the upper section of Whipple Wash on the eastern side of the range (Fig. S1).

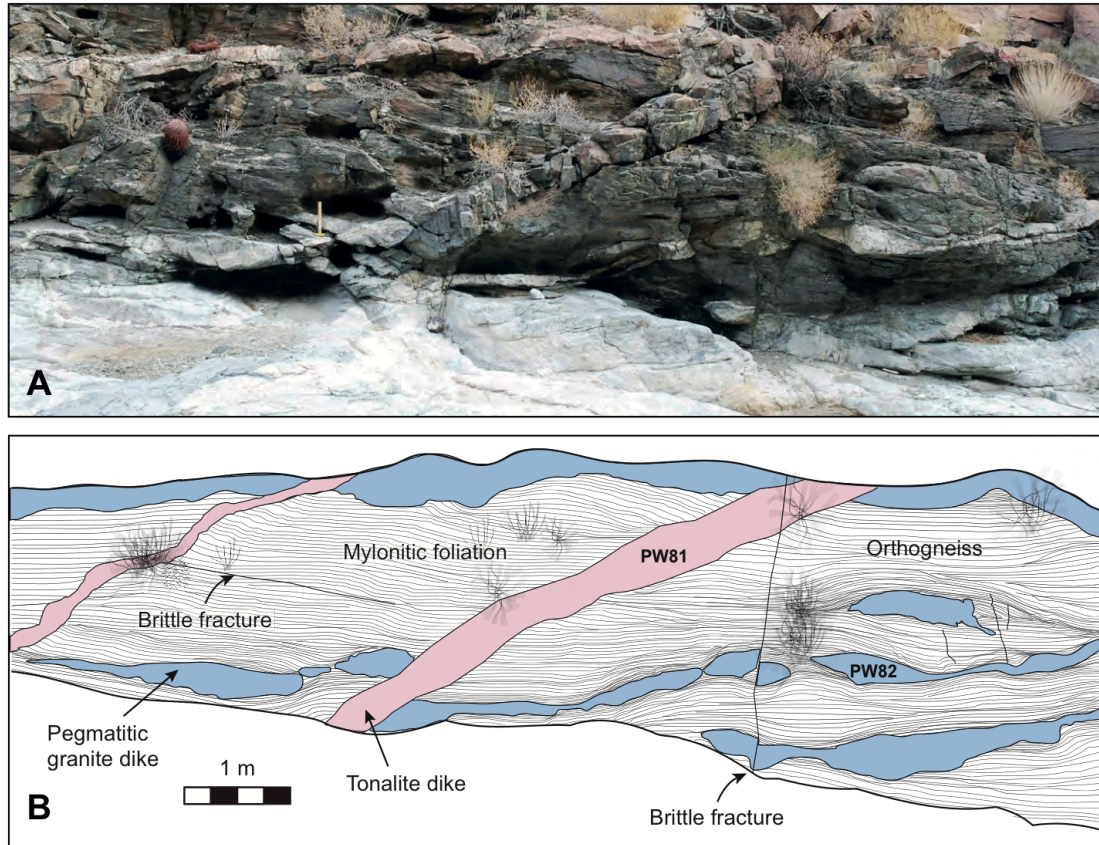


Figure S1. (A) Field photograph and (B) line drawing of deformed granite (blue) and tonalite (pink) dikes that we interpret to be pre- and syn-kinematic with respect to development of the mylonitic foliation. Dike PW82 (~65.7 Ma) is boudinaged and oriented parallel to the foliation, suggesting that it was already present at the onset of mylonitic deformation. Dike PW81 (~24.2 Ma) cross-cuts the mylonitic foliation, but is itself mylonitized under high-temperature conditions of >450°C, based on the presence of dynamically recrystallized feldspar.

S2. U-Pb zircon analyses

U-Pb zircon analyses were performed at the University of California, Los Angeles on a CAMECA ims-1270 ion microprobe in mono collection mode. Secondary ions were generated by sputtering with a 12 nA O^- primary beam with a spot size of 25 μm . Mass spectra were collected at a resolution of 5000 to exclude molecular interferences on Pb isotopes. Analyses consisted of 12 magnet cycles to ensure that no mixed age zones were encountered that could lead to spurious ages. Standard AS3 (1099.0 ± 0.7 Ma, Paces and Miller, 1993) was used to calibrate the U/Pb ratio calculations and all unknowns were within the measured UO/U range of AS3 standards. Standard 91500 (1063.6 ± 1.4 Ma, Schoene et al., 2006) was used to calculate concentrations of Th and U. Results are provided in Supplementary Table S1 and Figures S2.1 and S2.2. All dates are quoted at the 2σ confidence level.

Analyses of zircon rims, excluding older inherited cores, give weighted mean $^{206}Pb/^{238}U$ ages of 24.2 ± 1.0 Ma for PW81 and 65.7 ± 3.6 Ma for PW82 (reported at the 95% confidence limit).



Figure S2.1. Cathodoluminescence (CL) images of analysed zircons from PW81 (A) and PW82 (B). Locations of ablation pits and corresponding $^{206}\text{Pb}/^{238}\text{U}$ ages are given in Ma.

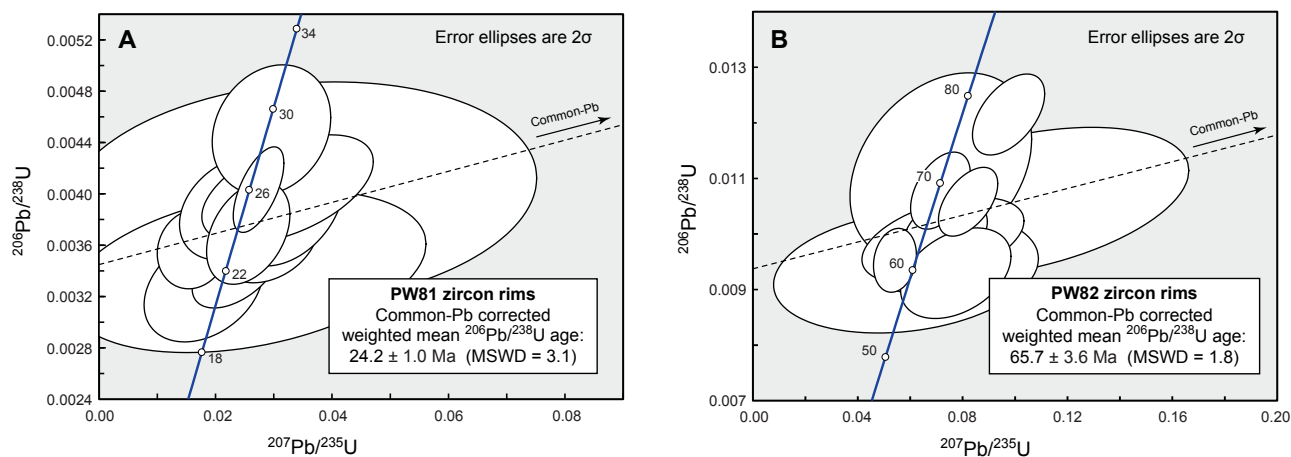


Figure S2.2. Wetherill concordia plots of zircon rim analyses for (A) PW81 and (B) PW82. Dashed lines indicate regressions from common Pb.

References

- Paces, J. B. and Miller, J. D.: Precise U-Pb ages of Duluth Complex and related mafic intrusions, northeastern Minnesota: Geochronological insights to physical, petrogenetic, paleomagnetic, and tectonomagmatic processes associated with the 1.1 Ga Midcontinent Rift System, *Journal of Geophysical Research*, 98, 13997–14013, 1993, doi: 10.1029/93JB01159.
- Schoene, B., Crowley, J. L., Condon, D. J., Schmitz, M. D., and Bowring, S. A.: Reassessing the uranium decay constants for geochronology using ID-TIMS U-Pb data, *Geochimica et Cosmochimica Acta*, 70, 426–445, 2006, doi: 10.1016/j.gca.2005.09.007.