GSA DR Item **2014087** accompanies Alsleben, H., Wetmore, P.H., and Paterson, S.R., 2014, Structural evidence for mid-Cretaceous suturing of the Alisitos arc to North America from the Sierra Calamajue, Baja California, Mexico, in Morton, D.M., and Miller, F.K., eds., Peninsular Ranges Batholith, Baja California and Southern California: GSA Memoir 211, https://doi.org/10.1130/2014.1211(22).

SUPPLEMENT

U-Pb geochronologic analysis of detrital zircon

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 New Wave/Lambda Physik DUV193 Excimer laser (operating at a wavelength of 193 nm) using a spot diameter of 25 to 35 microns. The ablated material is carried in helium into the plasma source of a GVI Isoprobe, 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 10e11 ohm Faraday detectors for ^{238}U, ^{232}Th, ^{208}Pb, and ^{206}Pb, a 10e12 ohm faraday collector for ^{207}Pb, and an ion-counting channel for ^{204}Pb. Ion yields are ~1.0 mv per ppm. Each analysis consists of one 20-second integration on peaks with the laser off (for backgrounds), 20 one-second integrations with the laser firing, and a 30 second delay to purge the previous sample and prepare for the next analysis. The ablation pit is ~15 microns in depth.

For each analysis, the errors in determining ^{206}Pb/ ^{238}U and ^{206}Pb/ ^{204}Pb result in a measurement error of ~1-2% (at 2-sigma level) in the ^{206}Pb/ ^{238}U age. The errors in measurement of ^{206}Pb/ ^{207}Pb and ^{206}Pb/ ^{204}Pb also result in ~1-2% (at 2-sigma level) uncertainty in age for grains that are >1.0 Ga, but are substantially larger for younger grains due to low intensity of the ^{207}Pb signal. For most analyses, the cross-over in precision of ^{206}Pb/ ^{238}U and ^{206}Pb/ ^{207}Pb ages occurs at 0.8-1.0 Ga.

Common Pb correction is accomplished by using the measured ^{204}Pb and assuming an initial Pb composition from Stacey and Kramers (1975) (with uncertainties of 1.0 for ^{206}Pb/ ^{204}Pb and 0.3 for ^{207}Pb/ ^{204}Pb). Our measurement of ^{204}Pb is unaffected by the presence of ^{204}Hg because backgrounds are measured on peaks (thereby subtracting any background ^{204}Hg and ^{204}Pb), and because very little Hg is present in the argon gas.

Inter-element fractionation of Pb/U is generally ~20%, whereas fractionation of Pb isotopes is generally ~2%. In-run analysis of fragments of a large zircon crystal (generally every fifth measurement) with known age of 564 ± 4 Ma (2-sigma error) is used to correct for this fractionation. The uncertainty resulting from the calibration correction is generally 1-2% (2-sigma) for both ^{206}Pb/ ^{207}Pb and ^{206}Pb/ ^{238}U ages.

The analytical data are reported in Table S-1. Uncertainties shown in these tables are at the 1-sigma level, and include only measurement errors.

Interpreted ages are based on ^{206}Pb/ ^{238}U for <1000 Ma grains and on ^{206}Pb/ ^{207}Pb for >1000 Ma grains. This division at 1000 Ma results from the increasing uncertainty of ^{206}Pb/ ^{238}U ages and the decreasing uncertainty of ^{206}Pb/ ^{207}Pb ages as a function of age. Analyses that are >30% discordant (by comparison of ^{206}Pb/ ^{238}U and ^{206}Pb/ ^{207}Pb ages) or >5% reverse discordant are not reported.

Gehrels, G.E., Valencia, V., Ruiz, J., 2008. Enhanced precision, accuracy, efficiency, and spatial resolution of U-Pb ages by laser ablation–multicollector–inductively coupled plasma–mass spectrometry. Geochemistry, Geophysics, Geosystems, v. 9, Q03017, doi:10.1029/2007GC001805.

Stacey, J.S., and Kramers, J.D., 1975. Approximation of terrestrial lead isotope evolution by a two-stage model. Earth and Planetary Science Letters 26, 207-221.