sigma = 1459452

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$^{40}Ar/^{39}Ar$ GEOCHRONOLOGY AT THE INSTITUTO DE GEOCIENCIAS, USP

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Laser heating $^{40}Ar/^{39}Ar$ geochronology provides high analytical precision and accuracy, µm-scale spatial resolution, and statistically significant data sets for the study of geological and planetary processes. A newly commissioned $^{40}Ar/^{39}Ar$ laboratory at CPGeo/USP, São Paulo, Brazil, equips the South American scientific community with a new powerful tool applicable to the study of geological and cosmochemical processes.

Detailed information about laboratory layout, environmental conditions, and instrumentation provides the necessary parameters for the evaluation of the CPGeo/USP $^{40}Ar/^{39}Ar$ laboratory suitability to a diverse range of applications. Details about analytical procedures, including mineral separation, irradiation at the IPEN/CNEN IEA-R1 reactor at USP, and mass spectrometric analysis enable potential researchers to design the necessary sampling and sample preparation program suitable to the objectives of their study.

The results of calibration tests using synthetic $CaSi_2$ glass and K2SO4 salt crystals, international mineral standards, and in-house mineral standards show that the accuracy and precision obtained at the $^{40}Ar/^{39}Ar$ laboratory at the CPGeo/USP facility is comparable to results obtained in the most respected international laboratories. Total fusion results for grains of Alder Creek sanidine (1.189 ± 0.005 Ma), Bern 4B biotite (17.3 ± 0.2 Ma), Bern 4M muscovite (18.53 ± 0.17 Ma), GA-1550 biotite (99.08 ± 0.15), USGS P-207 muscovite (82.0 ± 0.5 Ma), and HB3gr hornblende (1076 ± 2 Ma) are consistent with the accepted ages for these standards. Several irradiations of Fish Canyon sanidine fluence monitors yield values of 0.00016 $J.hour^{-1}$, a maximum horizontal variation of 0.0000026 $J\ units.mm^{-1}$, and a vertical variation of 0.000004 $J\ units.mm^{-1}$, results entirely suitable for high precision $^{40}Ar/^{39}Ar$ analyses.