

10th SSAGI

South American Symposium
on Isotope Geology

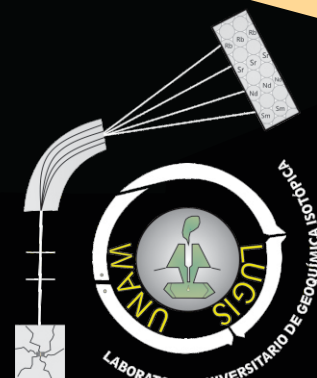
Latin America

Puerto Vallarta

México

May 22 - 25
2016

PROGRAM AND ABSTRACTS



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

ssagi10@geofisica.unam.mx

L. Díaz



UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

Instituto de Geofísica



Instituto de Geología



ORGANIZING COMMITTEE 10th SSAGI

Dr. Peter Schaaf

pschaaf@geofisica.unam.mx

Ing. Teodoro Hernández Treviño

tht@geofisica.unam.mx

M. en C. Gabriela Solís Pichardo

gsolis@geofisica.unam.mx

Dr. Raymundo G. Martínez Serrano

rms@geofisica.unam.mx

Ing. Gerardo Arrieta García

arrietagerardo@hotmail.com

M. en C. Lourdes Godínez Calderón

lourdes@igg.unam.mx



Laboratorio Universitario de Geoquímica Isotópica
LUGIS

2016



ARE THE ARCHEAN COMPLEXES IN THE BASEMENT OF THE SOUTHERN BRASÍLIA OROGEN ACCRETED MICROCONTINENTS?

Caue Cioffi; Mario Campo-Neto - Universidade de São Paulo, Brazil; *Andreas Möller* - University of Kansas, USA; *Brenda Rocha* - Universidade de São Paulo, Brazil.

e-mail: cauecioffi@usp.br

Keywords: Brasília Orogen, Archean complexes, Geochronology

The southern Brasília Orogen has been interpreted as the result of Neoproterozoic collision between the passive margin of the São Francisco and the active margin of the Paranapanema paleo-plates. The collision generated a stack of thick-skinned nappes with tectonic transport towards ENE. Basement rocks that represent a segment of the lower São Francisco plate form outcrops in a NE-SW oriented tectonic window that divides the orogen. This tectonic window is approximately 300 km long and 15 to 75 km wide and comprises mostly migmatitic orthogneisses interlayered with metasedimentary sequences. The orthogneisses can be divided into two main tectonic units: the Archean complexes (Amparo, Serra Negra and Heliadora) and the juvenile Paleoproterozoic Pouso Alegre Complex. New U-Pb zircon LA-ICP-MS data from two tonalitic migmatites from the Amparo complex yield igneous protolith crystallization ages of 3001 ± 9 and 3002 ± 10 Ma. A granodioritic orthogneiss from the Serra Negra complex yields an igneous protolith crystallization age of 2962 ± 11 Ma, with older zircon inheritance at 3.19 Ga and Neoproterozoic reworking defined by a lower intercept at 613 ± 13 Ma. A granodioritic orthogneiss from the Heliadora Complex gives a crystallization age of 2957 ± 14 Ma. Whole-rock Nd data from these samples yield slightly negative $\epsilon_{\text{Nd}}(t)$ values between -1.2 and -2.6 and T_{DM} model ages from 3.2 to 3.4 Ga. Zircon Hf data give slightly negative to positive $\epsilon_{\text{Hf}}(t)$ values from -0.4 to +4.7 associated with two-stage Hf model ages between 3.0 and 3.4 Ga. One granitic orthogneiss sample from the Amparo Complex yields a younger crystallization age of 2759 ± 13 Ma associated with a T_{DM} age of 3.0 Ga, interpreted as reworking of the 3.0 Ga protoliths at ca. 2.75 Ga. These new U-Pb data show a well-defined period of crystallization ages in the Amparo, Serra Negra and Heliadora Archean complexes between 3000 and 2960 Ma. Nd and Hf isotope data indicate mixed contributions from juvenile sources and slightly older continental crust. Published data from the Archean complexes in the southern São Francisco craton show crystallization ages spanning from ca. 3220 to 2720 Ma with a gap between ca. 3200 and 2930 Ma. The data presented in this contribution therefore indicate that the Archean complexes in the basement of the southern Brasília Orogen are exotic to the São Francisco craton as they show crystallization ages between 3000 and 2960 Ma, within the "magmatic gap". Most likely these complexes represent microcontinents accreted to the southern São Francisco paleo-continent. The timing of accretion is not well constrained, but it is most likely occurring after the development of the Pouso Alegre Complex arc-related suites between 2.15 and 2.08 Ga.