

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. Diaz



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



Dirección General de Asuntos
del Personal Académico

TIGHTENING-UP NE BRAZIL AND NW AFRICA CONNECTIONS: NEW U-Pb/Lu-Hf ZIRCON DATA OF A COMPLETE PLATE TECTONIC CYCLE IN THE DAHOMEY BELT OF THE WEST GONDWANA OROGEN IN TOGO AND BENIN.

Carlos Ganade - Geological Survey of Brazil, SGB/CPRM, Brazil; *Umberto Cordani* - Universidade de São Paulo, Brazil; *Yao Agbossoumoundé* - University of Lome, R. Togo; *Renaud Caby* - Geosciences Montpellier, Francia; *Miguel Basei* - Universidade de São Paulo, Brazil; *Roberto Weinberg* - Monash University, Australia; *Kei Sato* - Universidade de São Paulo, Brazil.

e-mail: caegeo@gmail.com

Keywords: West Gondwana Orogen; Dahomeyide belt; zircon geochronology; Brazil-Africa correlation.

The Dahomey belt in Togo and Benin is an important segment of the larger West Gondwana Orogen. Here, we review the geodynamic evolution of the Dahomey belt and discuss new U-Pb and Lu-Hf zircon data in light of similar data previously acquired on the geologically related Northern Borborema Province, in NE Brazil. Seventeen samples from different tectonic settings and regions within the belt were collected for zircon isotopic investigation. Passive margin deposits of the Atacora Structural Unit and lower units of the Volta Basin have detrital zircon signatures compatible with the flanking West Africa Craton. The arc-related magmatism originated due to the east-dipping subduction of the Goiás-Pharusian oceanic lithosphere is represented by a variety of granitoids emplaced in the Benino-Nigerian Shield between 670 and 610 Ma. These granitoids were mainly sourced from crustal material with subordinate juvenile input. Detrital zircons from syn-orogenic deposits in Benino-Nigerian Shield suggest that arc development could have started as early as 780 Ma. The main period of melting in the internal part of the belt related to crustal thickening occurs only ca. 30 m.y. after initiation of the continental collisional event marked by the ca. 610 Ma UHP metamorphism. Foreland development represented by the upper units of the Volta basin developed soon after continental collision and persisted with the development of the west-verging thrust front synchronously with the main period of melting at 580 Ma. The subvertical Transbrasiliano Lineament in South America corresponds to the Kandi Lineament in Africa and provides a prompt present-day fit between NW Africa and NE Brazil. Restoration of the movement of the Transbrasiliano-Kandi Lineament (strike-slip plate boundary) would place the Dahomey belt and Borborema Province (NE Brazil) along the same section of the West Gondwana Orogen. This configuration would explain some of the misfits previously discussed in the literature especially associated with the positioning of the UHP eclogites in Togo and NE Brazil.