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CORRELATION OF NEOPROTEROZOIC TERRANES BETWEEN SE-BRAZIL AND AFRICA: COMPARATIVE TECTONIC EVOLUTION AND OPEN QUESTIONS

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ABSTRACT

A comparative tectonic model for Southeastern Brazil and Western Africa in the scenario of Western Gondwana is presented, based on geological and geochronology data. In this Neoproterozoic puzzle, four main classes of terranes should be considered:

1) cratonic fragments older than 1.8 Ga and their passive margins successions: São Francisco-Congo, Angola-Kasai; Luis Alves-Rio de La Plata and the hidden Paranapanema. Massive occurrence of Mesoproterozoic granitoid rocks is restricted to the Angola fragment; 2) Reworked basement terranes with Mesoproterozoic and/or Neoproterozoic deformed cover. Examples are the Paraíba do Sul, Curitiba and Apiaí terranes in southeast Brazil; 3) Magmatic arc associations, such as the Oriental terrane (Ribeira belt) and the Western terrane (Kaoko belt); 4) Terranes with Palaeoproterozoic basement and deformed Neoproterozoic back-arc successions, such as the Cabo Frio terrane in SE Brazil. When this sector is investigated in detail terranes of SE-Brazil and West-Africa do not match easily. Based on the comparative investigation a tectonic model of polyphase amalgamation is proposed, whereby ca. 790 and 610 Ma major episode of generation of magmatic arc, both intraoceanic and cordilleran, along

both sides of the Adamastor Ocean. Diachronic collisions of the arc terranes and small plates followed at ca. 600, 580, 560 and 530 Ma. To each collision episode an important deformational event corresponds, associated with high grade metamorphism and crust-derived granitoid rocks. The tectonic complexity is compatible with an accretionary evolution from Cryogenian to Cambrian times. The São Francisco-Congo and Angola palaeocontinents were probably not monolithic, rather may have accommodated considerable convergence during the Brasiliano-Panafrican episodes. The final docking of Cabo Frio and Kalahari in the Cambrian was coeval with the arrival of Amazonia on the opposite side, resulting in lateral reactivation and displacement between the previously amalgamated pieces. The transition between the Cambrian and the Ordovician is marked by the extensional collapse of the metamorphic core zones of the orogens, with regional cooling and scattered bimodal magmatism probably related to slab detachment and underplating process.