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PALEOMAGNETISM OF THE 765 MA LUAKELA VOLCANICS IN NORTHWEST ZAMBIA AND IMPLICATIONS FOR NEOPROTEROZOIC POSITIONS OF THE CONGO CRATON

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ABSTRACT. The 765 Ma Luakela volcanics of northwest Zambia are a northeast-trending belt of basaltic to andesitic flows within an essentially undeformed and unmetamorphosed siliciclastic succession that unconformably overlies Neoarchean and Paleoproterozoic rocks of the Congo craton margin. Paleomagnetic analysis of 65 samples from nine sites isolated three magnetization components. Component A, carried mainly by single-domain magnetite, is directed very shallowly to the southeast and northwest, and is interpreted as a primary thermoremanent magnetization. Component B, carried mainly by hematite and oriented mainly shallowly upwards to the southwest, is interpreted to be a secondary overprint, possibly acquired during latest Neoproterozoic (Pan-African) deformation in the Lufilian Arc. A low-stability component C, probably carried by multi-domain magnetite or hematite, or both, is directed very steeply downward, and is similar to Late Paleozoic results from the region. Paleopoles LVA and LVB, corresponding to components A and B, are similar to previous results from mafic rocks of similar age in Tanzania. LVA (40.2°S, 122.0°E) coincides with a reliable pole for the 748 Ma Mbozi syenite-gabbro complex, confirming the position of the Congo craton at 765 to 750 Ma. The secondary LVB pole (38.3°N, 90.9°E), of uncertain age but younger than 765 Ma, coincides with the pole for the *ca.* 795 Ma Gagwe lavas, casting doubt on the assumed primary nature of the Gagwe remanence. Our new data imply that the Congo craton rotated *ca.* 90° clockwise between 750 Ma and the time of B-component acquisition, contrary to previous scenarios in which Congo rotated counter clockwise between *ca.* 800 and 750 Ma.

Key words: Congo craton, Katanga Supergroup, Lufilian Belt, Neoproterozoic, paleomagnetism

INTRODUCTION

The Congo craton (fig. 1) was amalgamated along several orogenic belts during Paleo- and Mesoproterozoic time, and by the Neoproterozoic consisted of the Archean-Paleoproterozoic Angola-Kasai, Bangweulu, Tanzania, Gabon, and São Francisco blocks, and Archean-Paleoproterozoic crust exposed along the northern and northeastern margins of the craton (see summary in De Waele and others, 2008). Along the southern Congo margin, mid-Neoproterozoic rifting and passive margin development were followed by "Pan-African" collisional events during the *ca.* 800 to 530 Ma formation of the supercontinent Gondwanaland (Johnson and others, 2005), within which the Congo craton occupied a central position. However, the positions of the Congo craton during breakup of the Rodinia supercontinent and the subsequent amalgamation of Gondwanaland are very poorly known (Pisarevsky and others, 2003), owing to the small number of reliable, well-dated Neoproterozoic paleomagnetic poles.

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