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# Lower Cambrian-Ediacaran paleogeography and True Polar Wander with new paleomagnetic constraints from the West African Craton

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## Résumé

The position of Laurentia during the Ediacaran (635-542Ma) is still highly debated. Paleomagnetic data suggest fast oscillations of the virtual geomagnetic poles (VGP) from high to low latitudes between 570 and 550Ma. These data are interpreted in the literature either as oscillations of the Earth magnetic dipole between polar and equatorial positions, or as True Polar Wander (TPW), implying a very fast tumbling of continents and perhaps, of whole Earth. If such phenomenon occurred, these VGP oscillations would have been recorded in every rock formed during this period.

In this study, we test these hypotheses by bringing new paleomagnetic data on volcanic series from another continent: the West African Craton (WAC). We have sampled well dated pyroclastic and lava flows from the Ouarzazate (upper Ediacaran) and Taroudant groups (lower Cambrian) in the Anti-Atlas, (Morocco). 500 samples from 105 sites were thermally demagnetized in laboratory. Our results highlight two major groups of directions, mainly carried by hematite; magnetite also contributing sometimes to the magnetization.

The first group displays a single polarity direction, with a shallow inclination and a south-east declination. This direction is close to the expected direction derived from the Permian-Carboniferous segment of the Gondwana apparent polar wander path (APWP), and may represent a remagnetization acquired during the Kiaman reversed polarity superchron (320-262Ma).

The second group, observed in the Ouarzazate and Taroudant groups, consists of a dual polarity high inclination direction and may represent the original magnetization. If so, no VGP oscillation is visible in the APWP of the WAC for the upper Ediacaran and does not favor neither TPW nor magnetic dipole oscillations for this epoch.

Moreover, assuming the Amazonian and West African cratons accreted, our results support the persistence of the Laurentia-Azania-West Africa continent up to the late Ediacaran. This paleogeographic configuration is consistent with geologic observations and could correspond to an ancient fragment of the past supercontinent Rodinia. In this scenario, Laurentia would drift at low latitude position all along the Ediacaran.

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