

Paleomagnetic and geochronological studies on Paleoproterozoic rocks of French Guyana (Guyana Shield): geodynamic and paleogeographic implications

1NOMADE, S., 1CHEN, Y., 2THEVENIAUT, H., 3FERAUD, G. and 1POUCLET A. 1UMR 6530, Université d'Orléans, France; 2BRGM, Orléans, France; 3UMR 6526, Université de Nice, France.

Paleomagnetism as a powerful tool has been helpful to understand the geodynamic history since 3 decades. However, most of available data were obtained on Phanerozoic rocks. Only 7% concern the Paleoproterozoic, which occupies more than 20% of the Earth life. In order to improve understanding of geodynamic history of the Guyana Shield, a combined paleomagnetic and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronological study have been carried out from French Guyana (Oyapock river) giving reliable thermal constraint upon magnetization. About 500 cylinder cores of granite and amphibolite have been drilled during three field trips from 1997 to 1998. Three characteristic magnetic components were isolated after both thermal and alternating magnetic field demagnetizations. $^{40}\text{Ar}/^{39}\text{Ar}$ geochronological datings on the paleomagnetically corresponding rocks associated with published $^{207}\text{Pb}/^{206}\text{Pb}$ ages permitted to calculate cooling rate of ca. 3° to $3.5^\circ\text{C}/\text{Ma}$. This slow cooling rate allowed us to constrain the magnetic ages of the three mean virtual geomagnetic poles (VGPs) which range from 2040 to 1970 Ma. Combined with the available paleoproterozoic paleomagnetic data from Venezuela, this enabled us to propose an apparent polar wander path (APWP) for the Guyana Shield between 1970 to 2040 Ma.