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Paleomagnetic investigations in Cambrian and Devonian rocks from the southern Sahara (Algeria)

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Poorly determined segments in the African Apparent Polar Wander Path (APWP) still exist, especially for the Lower and Mid Paleozoic times. To improve this APWP for the key periods of the Cambrian and the Devonian, paleomagnetic studies have been undertaken on volcanic formation of Cambrian age and on sedimentary formations of Devonian age, outcropping in the Tin Serririne basin in the southern Sahara (SE of the Hoggar shield, Algeria). These formations seem to be favorable for such studies, since: (i) they belong to the stable Saharan craton, (ii) they are generally well dated, and (iii) they present favorable facies in some local areas.

The preliminary results of the paleomagnetic demagnetization process (on 74 specimens of ignimbrites of Cambrian age, 123 specimens of Lower Devonian, 75 of Emsian, 126 of Givetian age) show a very complex recorded remanent magnetizations. Indeed, several magnetic components from each geological formation have been isolated.

Three of these components are interpreted as remagnetizations of Quaternary, Jurassic and Permian ages respectively. The others magnetic components are secondary too, but their interpretation remains uncertain, because they probably represent “intermediate” components, resulting from the superimposition of two or more of these remagnetization components with overlapping blocking temperature spectra. New data processing and detailed rock magnetic studies are necessary to clarify the process, the age and the chronology of the acquisition of the different components. This study shows again how complex the magnetic history recorded in some old rocks can be.