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Magnetic stratigraphy of the lower Beaufort group, Karoo basin (South Africa)

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The fluvial-lacustrine sediments of the Beaufort Group of the Karoo Basin of South Africa have been traditionally assigned a Late Permian age based on presence of Glossopteris flora and Dicynodont fauna. However, recently published U-Pb zircon ages suggest that the Permo-Triassic boundary lies below the Beaufort Group. In order to test this proposition, we performed magnetostratigraphic analysis of the Abrahamskraal Formation at the base of the Beaufort Group, coupled with U-Pb dating by ion microprobe (SHRIMP) of zircon from interbedded volcanic ashbeds (tuffs). Paleomagnetic analysis has found a partial remagnetization of the natural remanent magnetization, which is tentatively ascribed to the emplacement of the Karoo Large Igneous Province in the Western Cape region in the Jurassic. A stable component of the natural remanent magnetization was found at temperatures higher than 450°C and was interpreted as the characteristic remanence. The virtual geomagnetic pole position for the Abrahamskraal Fm. is in general agreement with the Permian/Triassic boundary direction of the continental Karoo. However, a slightly different average inclination, and thus paleomagnetic pole position, is obtained by correcting the inclination shallowing error by the Elongation-Inclination method. The U-Pb zircon ages of ca. 260-265 Ma and the presence of both normal and reversed polarities indicate deposition after the end of the Kiaman Superchron, confirming a Capitanian (late Guadalupian, Permian) age for the Abrahamskraal Fm.