

RECENT GEOMAGNETIC SECULAR VARIATION CHANGES OBSERVED IN SOUTHERN AFRICA

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Secular change of the Earth's magnetic field is a comparatively regional phenomenon and does not proceed in a regular and constant manner across the Earth. This gives rise to regions where the magnetic field changes exceptionally strongly on different time scales, currently for instance southern Africa where it has been observed in recent years that secular changes can take place on time scales of 1 year and less. As part of a cooperative project between Germany and South Africa, called *Inkaba ye Africa*, the COMPASS (COMprehensive Magnetic Processes under the African Southern Sub-continent) program aims to study the regional geomagnetic field and in particular its evolutionary behaviour. In addition to a rapid decrease of the geomagnetic field in this region, as evidenced by the 20% decrease observed at Hermanus, the orientation of the geomagnetic field in southern Africa is also changing rapidly. In the north-western part of southern Africa the declination of the magnetic field is propagating eastward (Tsumeb) and in the south-eastern part it propagates westward (Hermanus and Hartebeesthoek). This results in an overall increase of the spatial gradient over the subcontinent with time. This can possibly be linked to the presence of a patch of reversed flux at the Core-Mantle Boundary below southern Africa. During 2005, 2006, 2007 and 2008 joint field survey campaigns were conducted by the Hermanus Magnetic Observatory (HMO) and the Deutsches GeoForschungsZentrum (GFZ) in South Africa, Namibia and Botswana in order to characterize the time variation of different components of the geomagnetic field. Results obtained from these field surveys, together with data from the 3 continuous recording magnetic observatories in southern Africa at Hermanus, Hartebeesthoek and Tsumeb, are used to model the time variation of the geomagnetic field for 2005-2009. Results obtained indicate that a geomagnetic jerk is in progress in southern Africa.

Secular Variation & Jerks

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