



A global geomagnetic field model with focus on Africa for the past 2000 years

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In the past years, new archeomagnetic records from Africa have helped to improve our understanding of the geomagnetic field on this continent. Global geomagnetic field models reconstruct a westward movement of the South Atlantic Anomaly, a feature of low field intensity currently located over South America, which has passed over Africa within the last 2000 years. Additionally, during this time span two striking intensity peaks were observed at 800 AD and 1100 AD. However, these features are supported by few data from the African continent. The general paucity of data from Africa, compared to other regions, might introduce a bias on global geomagnetic field models around this region.

Here we present new archeomagnetic directions and intensities of the geomagnetic field from Ivory Coast and Burkina Faso (West Africa) from furnaces used for iron production. In order to understand the influence of these data on a global core field model, we perform a sensitivity analysis based on the data kernels. Furthermore, these data are incorporated in a new global geomagnetic field model for the past 2000 years, together with archeomagnetic and volcanic data from the Geomag50.v3.2 and the HISTMAG databases and additional data not included in these datasets. For a more detailed description of the field over Africa, we give a stronger weight on the African data and interpret the model over the African continent. Finally, we investigate periods of high and low geomagnetic field strength in Africa during the past 2000 years and their relation to the evolution of the South Atlantic Anomaly.