

EGU21-12503

<https://doi.org/10.5194/egusphere-egu21-12503>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Magnetostratigraphy from the Hominin Sites Paleolakes Drilling Project (HSPDP) drill cores, low latitudes reorientation

Mark Jan Sier^{1,2}, Guillaume Dupont-Nivet^{3,4}, Cor Langereis⁵, Andy Cohen⁶, and the HSPDP science team*

¹CENIEH, Paseo Sierra de Atapuerca 3, 09002 Burgos, Spain (marksier@gmail.com)

²Department of Earth Sciences, University of Oxford, South Parks Road, OX1 3AN Oxford, United Kingdom

³Geosciences Rennes UMR-CNRS 6118, Bat.15 CS 74205, 263 Avenue du General Leclerc Campus de Beaulieu, 35042 Rennes Cedex France

⁴Potsdam University, Department of Earth and Environmental Sciences, Karl-Liebknecht Strasse 24-25; 14476 Potsdam-Golm; Germany

⁵Paleomagnetic Laboratory Fort Hoofddijk, Faculty of Geosciences, Utrecht University, 3584 CD, Utrecht, The Netherlands

⁶Department of Geosciences, University of Arizona, Tucson, AZ 85721, USA

*A full list of authors appears at the end of the abstract

The Hominin Sites Paleolakes Drilling project (HSPDP) has collected around 2000 meters of drilled cores in lake sediment in Kenya and Ethiopia. All cores were drilled near important sites in human evolution with as main goal to help us better understand the influence of climate change on our evolutionary past.

An important first step in this research is building an age-model for these cores with magnetostratigraphy being important building block. However, building a magnetostratigraphy for the HSPDP cores is not straightforward. Due to the rotational movement of the coring process the azimuthal orientations of the cores is lost. This hinders the construction of magnetostratigraphy based of correctly orientated paleomagnetic samples. For high latitudes a high quality magnetostratigraphy can be reconstructed on the basis of the inclination of the paleomagnetic direction.

However, at low latitudes near the equator the inclination of the (paleo) magnetic field are near zero. As a result a magnetostratigraphy on the basis of inclination alone cannot be made.

In this presentation we discuss two methods that can be used to build a core based magnetostratigraphy at low latitudes. First, the anisotropy of the magnetic susceptibility (AMS) can be used in certain cases to reorientate the paleomagnetic samples by identifying the bedding of the sediments throughout the core.

Second, the present/recent low temperatures –low coercivity (LT/LC) overprint can be used to reorientate the paleomagnetic directions by orientating these LT/LC components towards the north and recalculate the paleomagnetic directions.

Both methods have been used on the ICDP Hominin Sites Paleolakes Drilling Project (HSPDP) cores taken in Ethiopia and Kenya with varied success. Here we will present data of four HSPDP cores as case study to help illustrate the effectiveness of these two methods for building a magnetostratigraphy for low latitude cores.

HSPDP science team: listed at <https://hspdp.asu.edu>.