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Recovering Magnetostratigraphy from Drill Cores Despite Low Latitudes

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A b s t r a c t

Magnetostratigraphy is an important building block for age-models of scientific cores. Due to the rotational movement of the coring process the azimuthal orientations of the cores is lost hindering the construction of magnetostratigraphy based of correctly orientated paleomagnetic samples. For high latitudes a high quality magnetostratigraphy can still be reconstructed on the basis of the inclination of the paleomagnetic direction alone. For example in northern latitudes a downward inclination is interpreted as normal and an upwards inclination as reversed paleomagnetic directions of the core samples.

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.

Here we present 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 overprint can be used to reorientate the ChRM directions by orientating these LT/LC components towards the north and recalculate the ChRM directions.

Both methods have been used on the ICDP Hominin Sites Paleolakes Drilling Project (HSPDP) cores taken in Ethiopia and Kenia. 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.