

C. Rolf (Referee)

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My final review is short. I feel the paper is clearly improved and is now ready for publication (short remarks and corrections included). In my opinion the authors have considered the comments of Professor Licht and Professor Jovane, as well as my remarks from the first review, and the rewritten paper has the quality to be published by *Climate of the Past* (CotP). This also applies to the significantly-improved written English.

Some remarks

The applied methods in palaeomagnetism are well described and fulfil modern standards. The additional thermomagnetic IRM method after Lowrie (composite IRM) and the further Kappa (T) (temperature dependent susceptibility) data help to understand the magnetomineralogical content of the sediments under investigation. Each method on its own is not enough to identify the character (primary or secondary) and type (magnetite or iron-sulphide) of magnetic minerals.

Perhaps the final interpretation of the rockmagnetic results could be better explained as summarized:

All Kappa (T) curves start with extremely low values in comparison with the susceptibility values at the end of the heating experiments. Assuming that there is a primary ferro(i)magnetic mineral content that did not form during the heating experiments, (as indicated by the IRM experiments) the Kappa(T) experiments seem to indicate magnetite (Fig. 5b) and pyrrhotite (Fig. 5a; c-e), as written. This result is confirmed by the IRM experiments (Fig 5) for magnetite and subtly for pyrrhotite (k, l, m, and o). Figure 5 n is typical of pyrrhotite. ZFC and FC data help to distinguish pyrrhotite and greigite, if there is a difference between ZFC and FC data, so that it hints at pyrrhotite.

On page 10, line 23, you wrote about hexagonal pyrrhotite and later only about monocline pyrrhotite. Do you feel that both minerals are primary? Perhaps you could write one sentence about this.

Cyclostratigraphic study on susceptibility data improves the paper and makes your correlations more profound. Please suggest which orbital cycles you mean (written somewhere, but it should be repeated on page 14, L21-22).

Question cycles well than rhythms?? I would suggest cycles (English?).

Construction of GPTS in your new Table 1 is much improved. The table is tighter and your different correlation possibilities are now better to understand. The former difficulties recognised by Prof. Licht and Prof. Jovane in relation to your basic stratigraphic assumptions, i.e. the correlation of the magnetozones to chronostratigraphy and the missing palaeoclimatic interpretation seem to me to be overcome now, but I do not feel to be competent enough to argue for or against these points.

Minor corrections:

P2, L6; **magnetostratigraphic** instead of magnetostratiphic

P2, L23; **Antarctica** instead of Antarctic

P4, L26; **who** instead of that

P5, L14; repeated point

P6, L5-7; "For the overlying Huangniuling Fm, **it is basal 30** meter was measured and major lithological changes in its upper part are noted". Unclear sentence, please rewrite.

P6, L 19; cut into **2 cm cubes** (8cm³) instead of 2cm*2cm*2cm

P8, L23; frequency bands (**long and short eccentricity**)

P10, L16; ... 500°C (Fig. 5a-e), magnetite **minerals** were probably produced during the experiments
P11, L2-3; in my opinion your Verwey transition in Fig. 5g is over interpreted.
P11, L16; this reference (Snowball and Thompson 1990) is missing in the reference list.
P12, L 24;and a reversal test **passed the confidence criteria**.
P12, L27; **sections** instead of section
P15, L32; Guo **1996** but in references **2006** which one is correct please correct.
P 17, L28; on **Antarctica** instead of on the Antarctic
P29, L1; **now abandoned** instead of now-abandoned
P29, L7; between clays. and The (**missing space**)
P29, L23; susceptibility **of** the
P30, L4; **temperature dependence** of.... Instead of thermal changes of
Figure 5 f-j; please use different (or not too similar) symbols for FC and NFC data.

I feel the paper deserves to be published now.

Finally, thanks for your careful revision and your comprehensive discussion of all of our arguments. I hope that your paper will be published now.