

Interactive comment on “A linear theory of physical properties in inhomogeneous sediments and its application to relative paleointensity determination” by K. Fabian

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This is an original and interesting approach to this complicated problem. I am in favour of publication provided that the author responds most comments by the reviewers and more specifically to the following points.

Referee 1 I agree that the paper can be seen as a little bit provocative as it goes against the current rules which require magnetic homogeneity of sediments before attempting paleointensity studies. The paper assumes that all sediment phases change in parallel which, as mentioned by the referee, is not the case in natural environments. A little discussion which would describe potential differences between natural environments

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and the present assumptions could be useful. I also agree that the sentence in the abstract "common magnetic ...to the normalizer" cannot be clearly understood without reading the paper.

Referee 2 The major weakness of the paper is the absence of comparison with the real world. It may be correct that some records with inhomogeneous sediments work better than expected but this remains to be shown clearly with examples. I agree with the point developed by the referee that the restriction to the paper by Haag needs to be clarified. I also follow the reviewer regarding the definition of a good record. We can effectively assume that the field variations are correctly described by Sint-200. However we must also consider the error bars inherent to the construction of the stack. There is no doubt that this paper calls subsequent developments and additional data for testing, which in itself justifies publication. The comment regarding the normalizing bias is also pertinent. It would be interesting to have a few examples with estimates of the deviations induced by non zero bias on the paleointensity record. This remark holds in general for the entire manuscript. Specific examples would greatly improve the value of the conclusions for the paleomagnetic community. The observations derived from "A comparison of different techniques of relative paleointensity, Geophys. Res. Lett., Vol. 25, N°1, 89-92, 1998" could be interesting. It is shown that coeval samples from different cores with similar concentration can be characterized by different relative paleointensity but remain identical with any technique, which may result from non linear response of the sediment. Among several other possibilities pDRM acquisition is non linear and changes with lithology.

Please consider also the request regarding the figure.

Interactive comment on eEarth Discuss., 1, 51, 2006.

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