High quality magnetostratigraphic data have recently been obtained from the Uchur Maya Region (south-eastern Siberian platform, Pavlov and Gallet, GGG, doi:10.1029/2009GC002583, 2010). This more than one billion year old magnetostratigraphic sequence shows magnetizations carried by magnetite and hematite, the latter displaying shallower inclinations. This shallowing can be interpreted as reflecting compaction on the tabular grains of hematite during the burial of sediments, as confirmed by the fact that a single best flattening coefficient can bring the distribution of hematite-bearing directions consistent with that of magnetite. For most measured samples within the magnetostratigraphic sequence, two independent magnetite and corrected hematite directional values could thus be recovered. These values not only provide information about polarity reversals, but possibly also about tectonic movements, paleosecular variation and the way this paleosecular secular variation may have been partially smoothed during deposition. Disentangling this information is however no simple task.

In an attempt to do so, we show how a statistical approach designed for paleosecular variation and time-averaged field investigations of recent lava flow data (Khokhlov et al., GJI, doi:10.1111/j.1365-246X.2006.03133.x, 2006) can be adapted to test well-defined scenarios (i.e. assuming some time-averaged field, paleosecular variation, geographical drift, sedimentation rate and type of smoothing). Using this method, possible interpretations of the observed magnetostratigraphic data will be provided and discussed.