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Comment on gi-2021-13

Anonymous Referee #1

Referee comment on "Assessment of the influence of astronomical cyclicity on sedimentation processes in Eastern Paratethys based on paleomagnetic measurements using Discrete Mathematical Analysis" by Boris Dzeboev et al., Geosci. Instrum. Method. Data Syst. Discuss., <https://doi.org/10.5194/gi-2021-13-RC1>, 2021

The presented work concerns adaptation of a new DMA method for solving problems in cyclostratigraphy. Authors apply a smart mathematical tool that rests on the analysis of spatial periods and try to detect global astronomical cycles. Despite a clear presentation and an original approach, the article requires a major revision.

The main issues are as follows:

- The work describes the validity of frequency maxima for Fourier and Lomb periodograms, but there is not a single word about the validity of DMA periods. The validity criterion of the new method should be described in detail, especially as concerns the detection of several characteristic periods (line 280), not a single one ('global' minima, line 276).
- The article should show advances of the new method over the widely used Fourier transform (uniform data) and Lomb-Scargle periodogram (un-uniform data). It seems, resting only on the information presented in the article, that the DMA method loses to the above-mentioned transformations.
- Authors use both frequencies and periods to present the results. This complicates the perception. A single physical quantity should be used. Also a uniform presentation should be used in figures for convenience.
- A more detailed explanation is required to the transformation of spatial periods of DMA method into time estimations of cyclicity.
- A detailed description of the generally used discrete Fourier transform (lines 109-122) is worth to be reduced, especially taking into account the thing that a mathematical algorithm is described in words.

With the above issues the article can be recommended for publication after a major revision.