



EGUsphere, referee comment RC2
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Comment on egusphere-2022-733

Martino Foschi (Referee)

Referee comment on "Seismic amplitude response to internal heterogeneity of mass-transport deposits" by Jonathan Ford et al., EGU sphere,
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The author investigated on the acoustic reflectivity of a mass transport deposit (MTD) from an area offshore the Blake Sea. The database is composed of geophysical data and core data. The latter intersects the shallower section of the 35 metres' thick MTD. The core data shows clear stratification, while the geophysical data exhibits acoustic transparent facies. Acoustic transparency is known in literature, and it is generally associated with lack of structures or stratification. The authors build a number of geological/elastic models that are consistent with a general view that MTDs are characterized by an internal featureless (random) character. The models are then recorded using single and multi-source acquisition synthetic experiments (forward modelling) and the resulting images show that the more random character MTDs are characterized by lower amplitude and no coherent reflectivity.

On my view the authors and the method used fail to really address the actual significance of the acoustic character of MTDs and study produce little advancement on the understanding of MTDs in general. The elastic models are what the authors believe the internal characteristic of an MTD is. The results are compatible only on those proportion of MTDs where the model assumptions are met. MTDs are far more complex features, characterized often by region of compression and extension, with faults, folding, residual stratigraphy of the transported blocks and so on (the authors seem to be aware of that) and these features are often observed on geophysical data.

Instead of proposing a generalized model for the internal characteristics of MTDs in general the authors should investigate on the character of the MTD in this study. The MTD is stratified, so the authors should better address the fact that a stratified media can still be nearly acoustic transparent. Also, is the binary model proposed not compatible with the studied MTD? Does the depositional environment mixed most of the lithologies so that all the thin layers observed in the core are characterized by similar elastic parameters? The model, in my view, should benefit more from core data, which intersect and sample the MTD for at least 15% of the actual thickness. The core information is expected to extend a few meters horizontally over the actual cored surroundings and provide a small, but real,

depositional character of what the MTD is.

Otherwise, the manuscript reads quite well, and it is very easy to follow. The figures and the data used are of great quality. The method section could be shorter with most of the model description transferred into a table. Conversely, the tables contain very little information and could be written along the text. The discussion should be rewritten based on the results. More detailed points have been added to the attached pdf.

Please also note the supplement to this comment:

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-733/egusphere-2022-733-RC2-supplement.pdf>