



EGUsphere, referee comment RC2
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Comment on egusphere-2022-230

Franck Audemard (Referee)

Referee comment on "Upper-lithospheric structure of northeastern Venezuela from joint inversion of surface-wave dispersion and receiver functions" by Roberto Cabieces et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-230-RC2>, 2022

The authors of this study propose a new 3D model of shear wave velocity (V_s) and moho depth of eastern Venezuela, from the Caribbean Basin in the North to the Guiana Shield in the South, using both receiver function alone for Moho depth imaging and a joint inversion of Rayleigh and Love phase and group velocity measurements obtained from noise cross-correlations, using an amphibious (land-ocean) seismometer array. This 3D model is build from 1D profiles spaced $0.5^\circ \times 0.5^\circ$. The authors use H-k stacking for measuring Moho depth and a linearised least-squares inversion to obtain surface wave dispersion curves and then use a hierarchical, transdimensional bayesian inversion scheme to jointly invert surface-wave data and receiver function data for shear wave velocity. The results show clear geographical coherence and known geologic features. Overall, this study seems to improve knowledge of the area. However, even if my field of expertise is not the use of earthquake waves to image Earth Interior, I have three major concerns about this contribution:

- 1) Some figures need to be improved. Particularly, Figure 1 (left panel) should only show seismicity used during this evaluation,. Minor comments on the other figures are provided in an annotated pdf.
- 2) Some previous internationally-reviewed studies on crustal structure of the same region by local researchers (e.g., Schmitz et al, 2005, 2021), using other methods (e.g. wide-angle data) are curiously not cited. Of course, comparison of results between those different studies (with different approaches: active seismics) is not presented.
- 3) the authors keep the comparison of their results to other similar (geophysical/seismological: passive seismics) studies: Niu et al.; Miller et al.; Masy et al.; Arnaiz et al., and so on. It would seem that they are well aware of the Bolivar Project results. However, even the aim of the paper being the correlation/imaging/identification of geological/tectonic/geodynamic features, little referencing of geological studies is applied.

For instance, the Espino Graben geometry and its Cenozoic-Quaternary southward directed inversion is well known from oil-industry seismics and other studies.

Minor comments, typo and form corrections are provided in annotated pdf of the contribution.

We wish to see this original version improved soon and quickly published in final format

Please also note the supplement to this comment:

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-230/egusphere-2022-230-RC2-supplement.pdf>