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Nonlinear Processes in Geophysics
Discussions

Interactive comment on "Inverting Rayleigh surface wave velocities for crustal thickness in eastern Tibet and the western Yangtze craton based on deep learning neural networks" *by* Xianqiong Cheng et al.

Anonymous Referee #2

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General comments: This paper did the pioneer study to propose a deep learning neural networks method, called stacked sparse auto-encoder (sSAE), to obtain crustal thickness for eastern Tibet and western Yangtze craton. The input data are the phase and group velocities of Rayleigh waves. It is a good try to introduce a new methodology.

Major modifications in need

Questions need to be answered: 1) The paper has not told the reasons selected eastern Tibet and western Yangtze craton, while this study solves the problems. 2) What

is the theory of the sSAE to inverse the crustal thickness with phase and group velocities of Rayleigh waves? The details to get the dispersion data, phase velocities, and their combination for the sSAE inversion? 3) How to understand the inverted results for eastern Tibet and western Yangtze craton? The geological background needs to be added. 4) What are the merits of sSAE over other methods in fact? For instance, deep seismic sounding profile is the direct evidence of crustal thickness, what happens when two kinds of results are mapped together? Not the digital number listed in the table. 5) How to understand Table 1? 6) What is the difference between the results by sSAE and by other method? Not just the similarity.

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