Nonlin. Processes Geophys. Discuss.,
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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "A denoising stacked autoencoders for transient electromagnetic signal denoising" *by* Fanqiang Lin et al.

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Author's Response for comments of review 1

Dear Anonymous Referee: We very much appreciate the overall positive attitude of the referee to our manuscript and thank you for your time and very useful comments! We give below responses to some of these. And we also give a marked-up version and a revised version.

1.The sample selection for learning is not clearly described in the paper. Please add the sample selection instructions, and specify the source of the samples and the selection principles. Reply: In the training experiment, we collected 2400 periods of transient electromagnetic method secondary field signals from the same collection location, and

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selected 434 data points in per period. Meanwhile, 100 periods of signals are randomly acquired as a test and validation set for the improving the robustness of the model.

2.Please describe the parameters of the experimental platform, the hyper-parameter indexes in the model, and the code of the main model module. Reply: Thank the reviewer for this comment about hyper-parameters, so we accept your suggestion to add more experiment details about learning rate, batch-size and so on. More details can be find in marked-up manuscript. Meanwhile, we upload the code of the main model module on github: https://github.com/tonyckc/SFSDSA.

3.Please add more description of the specific parameters and experimental details of kalman filter and wavelet transform. Reply: This question was described in detail in the fifth part of the original manuscript.

4.The related work section over introduces the encoder related literature. Please elaborate the literature of transient electromagnetic signal noise reduction and signal filtering. Reply: Yes, we introduce fewer related works about transient electromagnetic method signal noise reduction and signal filtering. Therefore, we describe more related works about TEM denoising using other Kalman filter and Wavelet transform method, and then adding more references. More details can be find in marked-up manuscript.

5.The loss in figure 1 is calculated as two regularized losses. What does that mean? It should be explain detail. ReplyïijŽ We are very sorry that make you think that we calculate two regularized losses because of our error figure. In fact, in Page 4 Line 14 we described that the theoretical signal is used to get the model loss with the output using the activation function. Meanwhile, we have replaced Figure 1 to a clear version.

6.Please explain the relationship between figure 5 and the corresponding explanatory text. And whether the coordinates in Figure 5 is correctïij§ ReplyïijŽ In the part 4, we narrated about the figure 5 detailedly. Small-scale deep learning model, and the training times can be less. As is shown in Figure 5, we set each batch to 8 and every 10 training steps output MAE value as a iteration sampling point. We found that the

MAE values near the 150th sampling point which will start oscillate. Both coordinates of the figure is logarithmic, the two coordinates have been modified. That can be seen in modified manuscript .

Please also note the supplement to this comment:
https://www.nonlin-processes-geophys-discuss.net/npg-2018-39/npg-2018-39-AC1-supplement.pdf

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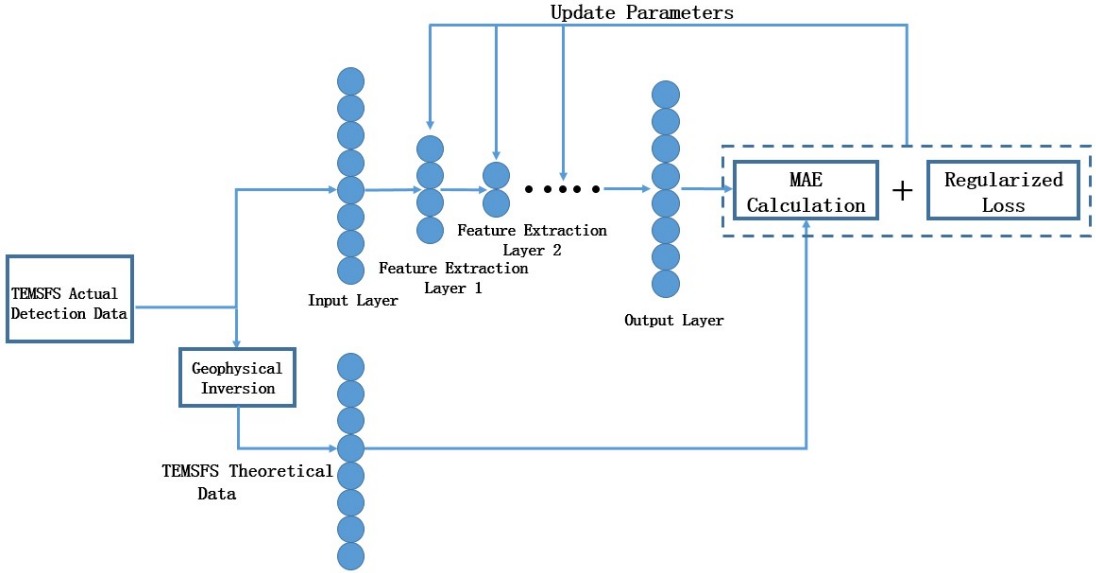

Fig. 1.

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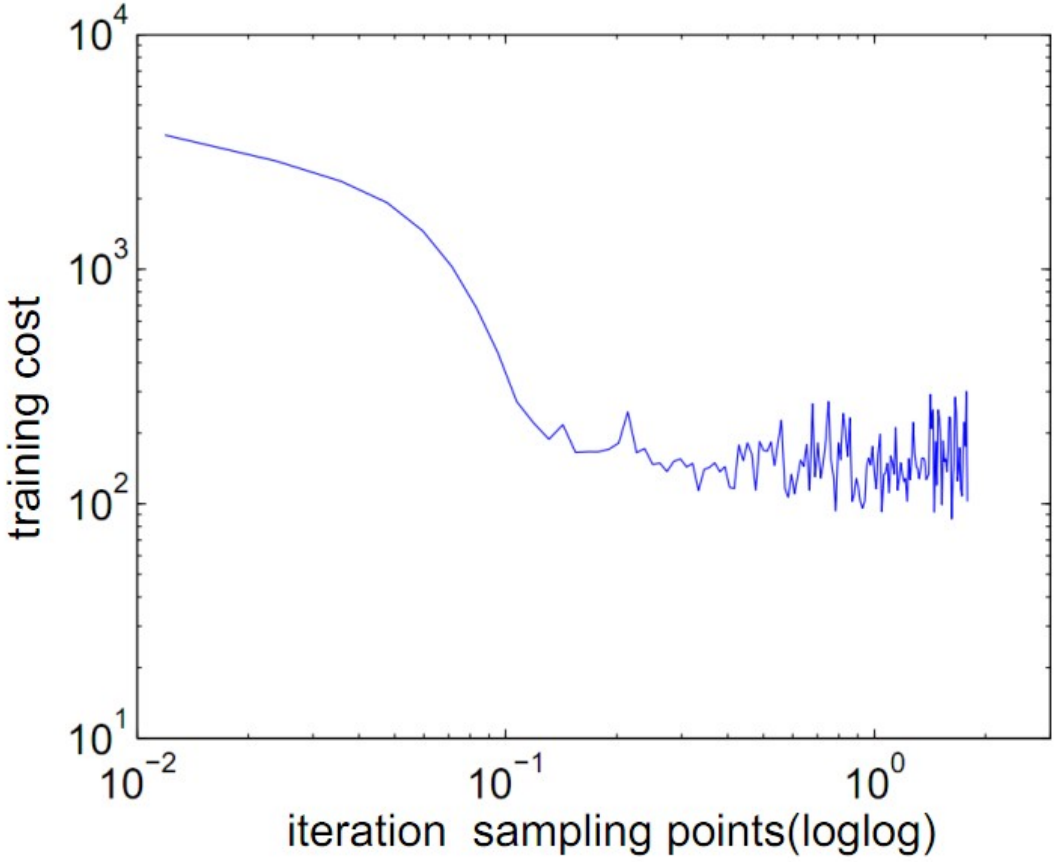
10^4
10^3
10^2
10^1
training cost
10^{-2}
10^{-1}
10^0
iteration sampling points(loglog)

Fig. 2.