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Interactive comment on "DINCAE 1.0: a convolutional neural network with error estimates to reconstruct sea surface temperature satellite observations" *by* Alexander Barth et al.

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General Comments: This is a good work. The author develops a new reconstruction methodology based on neural network with the structure of a convolutional auto-encoder. In this manuscript, the author uses the cross-validation and field comparison to prove the performance of DINCAE in SST reconstruction is better than DINEOF from some statistical results, such as RMSE and standard deviation. I also use the DINCAE 1.0 released on GitHub by author to fill gapped chlorophyll satellite images in another sea area and achieved satisfactory results. The first reviewer put forward very meaningful comments, which promotes the improvement of this manuscript. I think there are

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still some place to improve.

DINCAE is based on neural network, therefore its trained model can be saved and used to predict the other independent missing data. Considering the time parameter of DINCAE input is "days in year", the trained model should be able to fill the data for other years. I think this is one of the biggest different between DINCAE and DINEOF, but is not mentioned in this manuscript.

Many of the colorbar labels are incomplete or uninformative.

Page 7 line 1: Manuscript gives the size of complete dataset is 8 x 112 x 112 x 5266. But, I think “Scaled SST anomalies and inverse of error variance of the previous day” in the input parameters list (page 6 line 20) means two parameters and the size of complete dataset should be 10 x 112 x 112 x 5266.

Page 9 Equation 8: lacks a left bracket.

Page 11 line 1: Calculation efficiency is an important index to evaluate the reconstruction algorithm. The manuscript gives "Training this network for 1000 epochs takes 32 hours on a GeForce GTX 1080 and Intel Core i7-7700 with the neural network library tensorflow (Abadi et al., 2015)". I am also interesting on how many hours spent by DINEOF.

Page 12. Figure 3: What is the colorbar meaning? Please adding some information about colorbar in figure or the caption under figure.

Page16 line 5: The comparison between the measured data and the reconstructed data is the most persuasive validation method. I suggest adding the number of measured points, which can be more convincing.

Page18. Figure 7: The standard deviation of reconstructed SST by DINCAE and DINEOF along the southern coast of France and Corsica is larger than that of original SST. Why? The unit and label of colorbar are not given.

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