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Interactive comment on "MSDM: a machine learning model for precipitation nowcasting over east China using multi-source data" *by* Dawei Li et al.

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We sincerely thank you for your gracious comments about the potential of MSDM to tackle nowcasting problem. Below we address the thoughtful suggestions you have provided.

1. First of all, it is unclear why the authors prefer the multi-model method when it does not give the best results in comparison with others.

Response: In the revised manuscript, we make some modifications to MSDM, and it outperforms other baseline models in most of the metrics. Our original intention to build

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Discussion paper

the MSDM model is to make better use of meteorological data, as well as some existing deep learning and machine learning models. We hope to bring their advantages together through MSDM. In addition, the biggest advantage of MSDM is its transferability. Apart from satellite data, any other data (wind speed, pressure, temperature, etc.) can be used as input to the model. Meanwhile, not only the optical flow method can be used to extrapolate satellite data, but any other sequence-to-sequence model (ConvLSTM, TrajGRU, etc.) can be integrated into MSDM to extrapolate satellite data.

Changes in the manuscript: We modify the architecture of MSDM and introduce more metrics to evaluate model performances: CSI, HSS, FAR, RMSE, SSIM.

2. Furthermore, to me this method just seems like a combination of all other possible methods: Optical flow, Random forest and Convolutional Neural Network (CNN). Can one really disentangle what contributions to the solution of the problem are coming from each of the components? More insight into this is needed, especially if the method is not the one leading to the best results.

Response: Thank you very much for this suggestion. We summarize the contribution of these methods in the revised manuscript.

Changes in the manuscript: We use Table 4 to evaluate these models and discuss their advantages and drawbacks. The aim of our paper also be concluded in the 'Conclusions and dicussions'.

3. Parentheses and periods misplaced.

Response: We correct the use of parentheses and periods.

4. Incorrect double citations throughout the paper

Response: The change has been made.

Changes in the manuscript: We remove the repeated citations.

5. Many acronyms that are never defined.

Response: The acronyms have been defined

6. L11. its -> their or the

Response: The change has been made.

Changes in the manuscript: ‘due to the spinup issue’

7. L12-13. check sentence

Response: We have revised the grammar of the entire paper.

8. L14. ndarray?

Response: This is a specific data format from the numpy package in python.

Changes in the manuscript: We replace ‘ndarray’ with ‘tensor’.

9. L28. Unnecessary ’the’

Response: The change has been made.

Changes in the manuscript: Tremendous meteorological data are produced.

10. L74-75. Due to limits on computational resources

Response: The change has been made.

Changes in the manuscript: ‘Due to limits on computational resources’

11. Figure 6 increase the labels It is not very scientific to label the method being tested as ’ours’

Response: The ’Ours’ in figures has been replaced with ’MSDM’

Changes in the manuscript: The ’Ours’ in Figure 3,5,6 have been replaced with ’MSDM’

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