

Interactive comment on “Assessing water vapor tomography in Hong Kong with improved vertical and horizontal constraints” by Pengfei Xia et al.

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Dear Reviewer,

First of all, we would like to thank the anonymous reviewer very much. All the comments helped us improve the manuscript a lot. We are very appreciative of that. For each comment, we have carefully examined and answered with our best efforts. Thank you! Please kindly find enclosed our updated manuscript and our responses to each comment below.

Best regards

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Pengfei Xia

Anonymous Referee #2 Received and published: 17 June 2018 General comments
The paper investigates the improvement in the estimation of atmospheric water vapor by 1) constructing a new T_m model, 2) determining the scale height of water vapor, which used to calculate the vertical constraint and 3) Deriving the smoothing factor in the horizontal constraint. This study is interesting and worth to be published. It is well written and well-organized. Thank you very much for your comments.

Specific comments In page 20, section 4.2, lines 386-387. The authors set up a set of criteria to evaluate the tomography profile $PPC > 0.9$ and $RMS < 2.0 \text{ g/m}^3$. Can you please explain why you choose these criteria? Are there any references for choosing these specific numbers? Response: Thank you very much for your comment! We have set the criteria for evaluating the success of tomographic profiles (Jiang et al., 2014). These specific numbers of criteria was quoted from Jiang et al. (2014). However, due to the water vapor is relatively rich and there is a serious “inversion layer” in the vertical direction in August in Hong Kong, the thresholds of PCC and RMS ($PPC > 0.9$ and $RMS < 2.0 \text{ g/m}^3$) were redefined in this paper.

Jiang, P., Ye, S.R., Liu, Y.Y., Zhang, J.J., Xia, P.F., 2014. Near real-time water vapor tomography using ground-based GPS and meteorological data: long-term experiment in Hong Kong. *Ann. Geophys.* 32, 911-923.

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