

Dear authors,

the contents of the manuscript is now ok, but the English phrasing of newly added contributions is very poor. As you acknowledge a native English colleague for improving the English, I would ask you to lean on him again before a new version is submitted. Improving the language is not the task of the reviewers, editor and editorial office of the journal, but is the responsibility of the authors. I gave some examples in the proposed technical corrections, but these are far from being complete and a major improvement of the English, next to the ones mentioned by me, is still necessary.

Specific comments

- Page 5, line 8: which equations? Please refer to those.
- Page 7, Fig 2: a better (colour) map is required. You barely see the topography and the borders.
- Page 8: Give more details about the weather conditions at the two chosen periods. This can be short. For instance: “during the selected rainy period, the weather of Hong Kong was first affected by the approach and the passage of a severe tropical storm, named Merbok, with more than 150 mm of rainfall recorded on 13-14 June. Thereafter, from 15 and 16 June, the influence of an enhanced southwest monsoon and the development of a lingering trough of low pressure made the weather remaining unstable and rainy till 21 June.” For the rainless period, a description might be “With a ridge of high-pressure extending westwards from the Pacific to cover southeastern China on 16-18 August, a spell of fine weather prevailed ten days from 13 August to 22 August in Hong Kong.”
- I would make two separate sections for Internal accuracy testing (section 3.3) and External accuracy testing (section 3.4).
- Throughout the manuscript: I recommend using the dates instead of the DOYs for the two examples, in particular in the conclusions.
- Page 11, lines 7-8: where do these ranges come from? Are these minimum/maximum values? 75/25 % quartiles? Please specify.
- Page 13, caption Fig 6: replace “in the external accuracy testing” with “for the KYC1 station, which has not been used in the tomographic modelling”.
- Page 13: for the normalized RMS and normalized MAE computation, you write (on line 9) that residuals of SWV were divided by the GAMIT-estimated SWV, but did you also multiply with 100 thereafter, to obtain percentages? Please specify.
- Page 14, lines 1-3: when describing the normalized RMS and MAE, state that a consistent relative performance of the computed SWV is achieved, as they remain almost constant over all elevation angles. So, why are you adding “among all the weather conditions” here? Now it seems that different elevation angles reflect different weather conditions, which is obviously not necessarily true.
- Page 13 and 14, captions figures 7 and 8: explain which SWV residuals are referred too (you might also refer to Fig. 6). “SWV residuals” is too general and therefore meaningless.
- Page 17: When comparing the RMS between the GA tomography and the radiosonde WVD profiles with RMS from other studies, are referring to studies over Hong Kong as well? And which references have those studies used to calculate the RMS with?

Radiosondes as well? Please specify! Also mention if those methods are using the more common approach for tomography (least squares) and which constraints or external datasets have been used. Start this discussion with “We compare those values with the results obtained from other Hong Kong tomographic experiments. For example, ...” instead of the current awkward formulation.

- Page 19, Fig 12. Please give titles to the axis (altitude, latitude, longitude) and give the units of the colour scale.
- Page 20, Fig. 13: mention in the figure caption which “results” you are comparing (WVD).
- Page 22, Fig 15 caption: specify which dataset (radiosondes) is used to construct this figure and which periods (the usual one, I assume, but it is always good to note, as some readers primarily look at the figures when going through a paper).
- Page 23: line 3: Explain why larger values of slant water vapour lead to more errors in the tomography approach. And do higher PWV values (slant water vapour in zenithal direction) always lead to higher slant water vapor values, as you assume here?
- Page 23-24: The conclusions need to be rewritten. Instead of presenting the most important conclusions, you give a various location just a summary of the analyses you have been doing (e.g. “The WVD residuals were displayed in the form of box plot with a small boundaries and quartiles as well as no outliers”). Additionally, first of all, mention the dates for the two periods, not the DOYs. Secondly, you mentioned several times “internal/external accuracy testing”, but these general concepts should be more specified. Now, these concepts are rather meaningless. Describe very shortly the comparisons you did for internal/external accuracy testing when given the numbers etc. Thirdly, instead of writing “the statistical results show that”, just give immediately the statistical parameters you have been considering (RMS and MEA): every reader knows that these are statistical parameters.

Technical corrections

- Page 1, line 11: Replace “part in” with “substituent of”
- Page 1, line 13: replace “as a research point in the fields of” with “as a research area in the field of”
- Page 1, lines 14-15: replace “dose” with “does”
- Page 1, line 16: remove “which give rise to many limitations and difficulties”
- Page 1, line 16-18: replace with “Experiments in Hong Kong under rainy and rainless conditions using this approach show that ...”
- Page 2, line 1: replace with “Thanks to the development of GPS station networks providing atmospheric information under all weather conditions, GPS is considered ...”
- Page 3, line 1: give references of the MART and SIRT techniques and remove the brackets before e.g. and after (SIRT).
- Page 3, line 2: Only two vectorS
- Page 3, line 11: replace with “The used observation vector is based on...”
- Page 3, line 19: replace “usually” with “commonly”
- Page 3, lines 21-22: Replace with “External data cannot be used in all tomographic experiments.”

- Page 4, lines 1-4: be consistent and use commas (,) in the summation, not a mixture of , ; , .
- Page 4: Drop “and” before SWD.
- Page 4, line 13: Replace with “The ZTD is the primary parameter retrieved with GPS and is a spatially averaged parameter. If pressure measurements are available...”
- Page 4, line 17: replace ; with ,
- Page 4, line 23: replace with “The horizontal constraint equation assumes ...”
- Page 4, line 25: replace with “of its neighbouring voxels in the same layers”.
- Page 4, line 26: replace with “The vertical constraint equation is a relationship ... layers based on ...”
- Page 4, line 27: replace with: “The top constraint is obtained by setting the water ...”
- Page 5, lines 4-5: replace with: ... is required. More details on this technique can be found in e.g. Flores et al. (2000).
- Page 5, line 18: ... that best fitS”
- Page 6, lines 8-9: replace with “Based on these steps, the optimal solution of Eq. (10) is derived,
- Page 6, Fig. 1: CoEfficient Matrix
- Page 8, line 6: replace “were ready for” with “are available in”
- Page 8, line 15: replace “It is defined as” with “This period represents”
- Page 8, lines 31-32: Replace with “Fig. 3 illustrates this in the form of a grayscale graph for two different days : DOY 225 at UTC 00:00 (give the date and year here instead of the DOY), a rainless day (a), and DOY 164 (give the date and year here instead of the DOY) at UTC 12:00, a rainy day (b).
- Page 9, lines 8-9: Replace with “For the two examples shown, the number of total SWV, ...”
- Page 11, lines 9-10: Replace with “A particular outlier is the HKMW station, with RMS and MAE values 1.81/1.53 and ...”
- Page 11, line 13: replace “This specific impact should be discussed ...” with “This hypothesis will be further investigated in future research”.
- Page 11: drop the last sentence of this page or explain on which ground you come to this statement.
- Page 12, caption Fig. 5: circleS, diamondS
- Page 12, line 6: replace with “for those different weather conditions”
- Page 12, line 7, drop “and the reds are generally smaller than the blues, whether in the situation of MEA or RMS”. This is such a non-scientific statement!!!
- Page 12, lines 6-8: Reformulate into “From this figure, it can be noted that all MAE and RMS are below 15 mm, with average values lower for rainless days than for rainy days, respectively 8.75/7.33 and 11.38/9.54 mm. for RMS/MAE.
- Page 13, caption Fig 7: “for each elevation bin”
- Page 13, line 6: “slant water vapour outputs”
- Page 14, line 1: replace with “In terms of normalized RMS and MAE, we note that they remain ...”
- Page 14, line 6: replace “demonstrates” with “points to”
- Page 14, line 11-12: Replace with “IQR is the interquartile range, defined as the difference ...”
- Page 15, line 6. Replace with “As the radiosondes are launched daily at 00:00 and 12:00 UTC, the ... at these times were compared”.

- Page 16, line 1. Replace with “It is clear from the profiles that the WVD decreases with increasing height.”
- Page 16, lines 3-4. Replace with “in the upper troposphere in absolute terms”.
- Page 16, line 7: replace with “while the water vapor content resides for more than 90% below ...”
- Page 16, caption Table 2, and line directly below table 2: replace with “RMS and MAE of the water vapor density ...”
- Page 17, line 8: please be more specific on “utilizing the new parametric methods and the traditional methods”: which methods are you referring to?
- Page 18, lines 6-7: replace with “vapor density can be achieved with high accuracy by tomography based on the GA. The corresponding box plots are shown in Fig. 11. It can be noted that the WVD residuals ...”
- Page 18, Fig. 11: Rainy dayS, Rainless dayS. And in the caption of this Figure: specify that the WVD residuals are computed between GA tomographic approach and radiosondes.
- Page 18, line 18: Replace with “... can be found in detail in e.g. Flores ...”
- Page 19, line 1: Replace “according to the pressure layer” with “at different pressure levels”.
- Page 19, line 2: Replace “can obtain” with “give”
- Page 19, line 3: Drop “For tomographic results”.
- Page 20, lines 1-2: Replace with “To further analyze the tomographic results of the GA and the least squares method, regression and boxplot are constructed and displayed in Fig. 13, which covers all solutions, each of them containing 560 voxel results.”
- Page 20, line 4: Change to “The right panel shows”
- Page 20, line 6: add “that” after means
- Page 20, line 7: replace with “Consequently, the tomographic results based on the GA are in agreement with those of the least squares method for this experiment”.
- Page 21, line 4: Remove “The numerical results including”. This is such an awkward and meaningless expression.
- Page 21, line 7: Replace “a little” with “slightly”.
- Page 22, line 7: Replace with “which is also concluded in other studies (Yao et al. ...)”.
- Page 23, line 13: “we think” is not a very scientific statement. You can quantify the relative amount of WVD that you are missing in your tomography experiment by neglecting the layers above 8 km.