Interactive comment on "Presence of continental and Bay of Bengal moisture in rainfall at Kolkata, revealed through simultaneous observation from land and sea during South-West monsoon of 2004" *by* Shaakir Shabir Dar and Prosenjit Ghosh

Anonymous Referee #2

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General Comments

The manuscript aims to quantify the moisture contribution from the Bay of Bengal and from the continental sources for the rain in Kolkata during the monsoon season. They made use of meteorological and stable isotope observations, besides air masses trajectory analysis with the HYSPLIT, and Craig and Gordon model and Rayleigh fractionation model. In my opinion, it is an interesting work, but the paper needs major review in order to reveal its potential. Maybe clarifying some points, and improving the writing style could help to communicate the aim and the results to the reader. Please, consider

my suggestions for a revised version of the manuscript.

Specific Comments Abstract: I suggest to re-organize the abstract clarifying mainly the objectives and method. It is necessary to define the acronym SW monsoon before its first use. It's not clear the period of analysis. Was the study performed for the 2004 Monsoon?

Introduction: I miss a brief explanation concerning the SW monsoon to introduce its major aspects to the reader from other regions.

P1L16-17: "Precipitation is the primary source of water on land, brought by the moisture generated due to evaporation of ocean water which gets advected towards the continent." Is the oceanic evaporation the only source of moisture for the land precipitation?

Gimeno, L., A. Stohl, R. M. Trigo, F. Domínguez, K. Yoshimura, L. Yu, A. Drumond, A. M. Durán-Quesada, and R. Nieto (2012), Oceanic and terrestrial sources of continental precipitation, Rev. Geophys., 50, RGXXXX, doi:10.1029/2012RG000389.

P2L8: Please define GNIP (and other acronyms) in the first time they appear in the text. Once the acronym is defined, they can be applied elsewhere.

P2L11: Arabian Sea(AS). Arabian Sea appeared for the first time in the lines 7-8. Please, define the acronym there. You defined AS again in the line 19, check it.

P2L10-16: Please, re-organize the sentence. Maybe you can use brackets to cite the references and to separate them from the rest of the sentence. For example, "(Gupta and Deshpande, 2003; Rangarajan et al., 2013; Rahul et al., 2016)" instead of "Gupta and Deshpande (2003), Rangarajan et al. (2013), Rahul et al. (2016)".

P2L22-25: Please, clarify the aims. Explain the novelty of this work in comparison to the previous studies. In which way do you think your study complement the results obtained in previous works?

Data and method P2L29-32: Please, define TRMM and include a bibliographic reference for each one of the data sets used.

P3-L3-5: strange sentence.

P3-L6-12: There is a lack of information concerning the analysis with HYSPLIT. Please introduce the hysplit model. How does it work? the input data used? limitations of the model... Explain your experiments. How have u selected the rainy days during the 2004 SW monsoon in each one of these places? Which months have you considered in the analysis? Have you calculated 4-day backward trajectories, haven't you? Why have you chosen 4-day and not more (or less) days for the BW trajectory analysis? Do the elevations refer to the "initial position" of the particles at Bangalore and Kolkata? Do the colours of the different trajectories shown in the figure 4 identify the elevation of the particle at Bangalore and Kolkata, right? Or do the particles keep in the same elevation during the backward tracks? And why the HYSPLIT results are important for your study?

3.Discussion and results P4L9-13 I miss more discussion concerning the HYSPLIT results. Are you talking about the figure 4? Please, refer to the figures in the text. If I understood it correctly, from figure 4 you can identify only the regions crossed by the air particles tracks, not the moisture uptakes or losses by the particles. How can you affirm that there is "moisture originating from the Arabian Sea" from this figure?

P4L18 the months considered in the monsoon period would be defined in the introduction or data sections.

P4L19 you cannot conclude about the moisture origin from the hysplit trajectories shown here.

P4L28-P5L11 I would move it into the data&method section

P5L26-27 Please check the use of the brackets

Caption Table 2 and Table 3: Delete "Table shows the". Are the mean values calculated

C3

for which period?

Figure 2: Do the results refer to the 2004 SW monsoon?

Caption Figure 3: Please, delete "Both stations follow a similar depletion pattern for _18O indicating they are supplied by the same moisture source. The d-excess for Kolkata is greater but higher variability is observed at Bangalore. The highest difference between the two stations being observed during the start of the SW monsoon." Are the results obtained for 2004?

Caption Figure 4: Delete "It can be seen that majority of the trajectories pass through the modeling transect. Three types of trajectories can be identified, originating from Arabian Sea, Bay of Bengal or land."

Caption Figure 5: Please, delete "Moisture supplied by the Arabian Sea under the prevailing wind direction is modified by rainout and vapour addition by the Bay of Bengal. The final composition is as result of mixing between the moisture from the two sources."

Captions Fig 6: What do the bars mean? Please, delete "It is clear that our model predicts the isotopic composition of stations in the boxes within the modelling transect."