

Interactive comment on “Characteristics of Monsoon inversions over Arabian Sea observed by satellite sounder and reanalysis data sets” by Sanjeev Dwivedi et al.

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This is a detailed study on an important phenomenon, namely, temperature inversion over the Arabian Sea during the boreal summer. Unique geographic location of the Arabian Sea and wind/pressure field give rise to strong inversions, however, this has not received much attention. Authors combine data from a variety of sources and have carried out a detailed analysis. I recommend its acceptance after a revision accounting for the comments given below. First of all we wish to thank the reviewer for going through the manuscript and appreciating the actual content of the work. We have taken care all the comments/suggestions made by the three reviewers.

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1. P.35279, line 9. Colon (1964) also used dropsonde data

Reply: We have reframed the sentence on Page 35279, line 9 as “from ship radiosonde and aircraft dropsonde data by Colon. . . .”

2. P.35282, line 15, support product availability at 100 pressure levels looks too high a vertical resolution.

Reply: We once again checked the data product and confirm that we have written correctly. Note that we are using support products which are available at 100 pressure levels up to 70 km (0.016mb).

3. p.35284, line 13-15: MI lies between 900 & 800 hPa. Authors infer MI from DT between 950 and 850 hPa. This may be alright for the WAS however, may miss the MI over the EAS. As authors pointed out referring to Colon (1964), MI rises from west to east over the Arabian Sea. So why not define DT between 950 hPa and a level at or above 800 hPa?

Reply: We have examined each and every individual profile to capture inversion height, depth and strength. On the basis of this computation, Fig 3 has been generated. From this figure it could be ascertained that in more than 95 % of cases, the inversion over Arabian sea is lying in the region 950 and 850 hPa. We have also mentioned in the text (Page 35285, lines 24 – 25) that “This level criteria (950 – 850 hPa) was arrived at after a detailed examination of ΔT at a few more level intervals (.)”. As mentioned in the manuscript, the upper / lower levels of inversion vary on individual days in a small amount (~ 25 hPa). Even if the lower or upper level of inversion were at levels above 850 or below 950 hPa by this small amount, the inversions would still be captured in the overall ΔT , though of a slightly lesser magnitude.

4. Fig. 2, x-axis: Julian day can be used

Reply: We have changed x-axis to Julian day in all the 3 figures.

Finally, ERA-interim data might have utilized IASI data product. So, can that be an

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independent source for comparison?

Reply:As mentioned in the manuscript there is no ground truth (after 1979) over the Arabian sea to compare with our results. Hence we have compared with ERA, the only available standard option of comparison over AS. We have mentioned the referee's point in the text.

There are some grammatical errors and the text can be reduced by eliminating some repetitions.

Reply:We have gone through the text again and try to eliminate repetitions and grammatical errors to the maximum possible extent.

Some corrections :

1. One mistake in referring figure on Page 35286 line 23 As Fig.2 to replace with Fig.3

Reply: Corrected.

2. Page 35282, line 7 Fourier to replace with fourier

Reply: Since Fourier is the name of the scientist we retained it with capital letter F.

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 35277, 2015.