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Atmospheric Measurement Techniques Discussions

Interactive comment on "A relative humidity profile retrieval from Megha-Tropiques observations without explicit thermodynamical constraints" *by* R. G. Sivira et al.

Anonymous Referee #2

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The paper develops a transformation method for SAPHIR and MADRAS observations. Although, the subject is relevant to ATM and also valuable in terms of deriving troposphere humidity from SAPHIR observations, but the authors have left several important questions unanswered. Besides, the authors need to carefully analyze the current methods that are available for the same purpose and justify why a new method is required. I recommend a major revision as there are several fundamental changes that need to be made before being ready for publication.

Major comments: 1. Why not just use adjust the empirical coefficients of Sonde's method for SAPHIR channels as the current method does not offer much moiré than

Soden's method. 2. The MADRAS instrument failed after launch, so what is the advantage of using MADRAS simulated data ? Isn't better to focus on SAPHIR instrument? The method cannot be later used at all if the MADRAS data are required as input! 3. I highly recommend avoiding using operational radiosonde data even for training the method as due to large error in humidity profiles [e.g., see Moradi et al. JGR 2013: 10.1002/jgrd.50589], the humidity and temperature profiles do not match. Besides, many of these profiles only reach up to middle troposphere. They have removed the profiles that do not reach 350 hPa but several of SAPHIR channels are sensitive to the altitudes above 350 hPa. One way is to extrapolate the profiles which itself introduces some error. So generally it is better to use reanalysis to train the method as at least the temperature and humidity profiles are consistent.

Minor Comments:

The title is really vague and doesn't represent the work.

Page 8986 – L7: the author states that none of the methods estimate the profiles from BT! How about Soden and Bretherton's method? The current method also doesn't come up with profiles but the layer-averaged values.

Page 8986 – L16: Remove "really"

Section 2.2.1 and elsewhere: The word "radiosonde" is more accepted in the communities than "radiosound"

Page 8990 L4: the issue over land can be avoided by using a proper PWV filet [see Moradi et al. JGR 2013: 10.1002/jgrd.50589]

Page 8992 – L24-25: The non-linearity exist for all the channels but it is larger for the upper tropospheric channels.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 8983, 2014.