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Hydrology and Earth System Sciences Discussions

Interactive comment on "Rainfall retrievals over West Africa using SEVIRI: evaluation with TRMM-PR and monitoring of the daylight time monsoon progression" *by* E. L. A. Wolters et al.

Anonymous Referee #1

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Overall review.

The paper presents the results of the KNMI CPP-PP precipitation algorithm applied to the West African region: the paper falls within the scope of HESS. The material that the paper provides is new and would be useful for users in order to ascertain the merits of the technique described, or the systems for which the technique is applied to.

The conclusions derived from the technique and its application is adequate for this type of paper, with sufficient results presented to enable the reader to gain sufficient knowledge of the application of the technique. The actual description of the CPP-PP

technique is not fully addressed in this paper, and is something that I do highlight below under the specific comments: it would be useful to refer to a specific CPP-PP technique paper.

The title and abstract are suitable for the paper, and the paper is overall well laid out in a logical sequence. I found no major issues with the language, apart from the specific items mentioned below. Diagrams, figures etc are suitable, and the number of references appropriate.

General Items.

It would be good, if possible, to have a definitive reference that describes the CPP-PP technique. While a few references relate to the technique I didn't find a particular one that adequately described the technique.

Specific items.

Abstract: Although this study focuses on Meteosat-9, of course, SEVIRI was also on Meteosat-8. Consequently the authors might want to change the reference to Meteosat-9 in the Abstract to Meteosat Second Generation (as noted on p6356).

p6355, l27: I was unclear what the 11% 'accuracy' really meant – does this mean that if a retrieval was made it would be within 11% of the actual value?

p6356, l19-21: I am surprised that the retrieval algorithm for a vis/IR technique was based upon one used for passive microwave retrievals – in what way was it adapted?

p6357, general: although the technique appears very promising, a big gap is obviously the lack of nighttime retrievals. It would be good for the authors to make some comment upon this (e.g. can the Re be derived from other surrogate data, etc?).

p6358, l21: the TRMM V5 PR data product is somewhat old now, and v6 has been around for many years (in fact v7 is due for release soon). Some of the issues noted in this paper are addressed in the v6 data, and certainly in the v7 data.

P6359, l11: the authors should specify how the 0.1x0.1 degree resolution was actually derived: was the data averaged? (i.e. all PR 4.3x4.3 km resolution data was averaged to the 0.1x0.1 degrees?).

P6359, l16: I understand why the authors chose to look at the mean/median rain rates rather than the spatial matches. However, it is critical to provide the rainfall in the correct place at the correct time, particular if dealing with large regions.

P6359, l27: I'm not sure why the authors downsized the number of samples from 14,000 to 10,000. Normally a bootstrapping technique would be used to improve the number of samples (or to seriously downsize a data set). A brief explanation might be useful.

P6360, l13: the study accumulates the gauge data over a 15-minute interval to match the SEVIRI sampling. However, the SEVIRI data is an instantaneous snapshot of the cloud tops, not an integrated measurement. While vis/IR techniques benefit from some time-integrated (due to the longevity of the clouds), the instantaneousness of the imagery needs to recognised. This might explain some of the distributions found later in Figure 3.

P6369, l3-16: The authors need to be careful here: the technique described here cannot be used for climatological work since it is daytime only – whereas data derived from TRMM can: comparison of the two is a bit of a mis-match.

Introduction

p6353, l17: use of 'passive imagery', although technically correct, would also include microwave radiometers, which are not what is really meant here. It would be better to specify vis/IR imagery.

p6354, l12: ..."Therefore continuous rainfall monitoring is of great importance."

p6355, l2-3: replace "over too wet soils" with "over soils that are too wet"

p6357, l20-21: "flagged precipitation", maybe put "precipitation" in italics?

p6358, l9: TRMM is really a Low Earth Orbiting satellite, rather than a polar (orbiting) satellite.

P6359, l19: please include a note of what the minimum threshold of the CPP-PP algorithm is.

P6364, l19: TEJ = Tropical Easterly Jet (I presume). Also spell out 'SST'.

P6365, l27: Expand CWP.

P6366, l19: Expand AEWs.

P6368, l5: replace 'until' with 'up to'.

P6368, l19: replace 'resolution' with 'sampling'.

P6368, l27: AEJ – African Easterly Jet?

Figure 2: in the caption, replace 'clouds' with 'retrievals'

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 6351, 2010.