Hydrology and
Earth System
Sciences
Discussions

Interactive
Comment

Interactive comment on "Status of satellite precipitation retrievals" *by* C. Kidd and V. Levizzani

Anonymous Referee #2

Received and published: 20 January 2011

Firstly, my apologies for taking so long to do this review.

General comments

This paper gives a brief review of the satellite sensors and retrieval techniques used to generate estimates of precipitation from space. This is quite a broad topic, so it was not possible in this paper to go into very much detail on any aspect of the problem. This paper makes extensive use of references throughout, so interested readers may follow up particular points of interest in the literature. The paper has a slightly "dated" feel to it, in that many of the key references date from 1990's and early 2000's, even for points that are not historical in context. There is a special collection of papers in Journal of Applied Meteorology and Climatology, resulting from the 2008 IPWG meeting in

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Beijing, but none of these papers were referenced by Kidd and Levizzani. Perhaps the authors could update their manuscript to include references to some of these more recent works.

Specific comments

1. p.8158, line 9 – don't need verification and validation, just stick with validation

2. p.8159 – You describe the various types of satellites, but don't say anything here about the sampling characteristics of the LEO satellites (though it is mentioned later in the paper). General information such as swath width and return frequency would be useful here. You don't need much detail. People unfamiliar with TRMM PR might not appreciate that it has extremely limited sampling capabilities, for example, and wonder why TRMM PR doesn't get more attention in the paper.

3. p.8161 – the nIR channels are useful for nighttime retrievals of cloud properties, but here you make it sound like they're not. Be careful about "observing cloud top temperature", when what you really observe is brightness temperature, which is only an estimate of cloud top temperature.

4. p.8162, bottom – Line 23, the comparison is against radiances computed from model-generated atmospheric profiles. 2nd last sentence talks about the advantage of physical techniques, but then the next sentence describes an empirical technique. May want to rearrange this paragraph or use a different example that describes a physical technique.

5. p.8164, line 16 – more representative compared to what?

6. p.8164, section 2.4, 2nd sentence – it is not clear from this sentence what is being blended. A few sentences later the different satellite retrievals are "combined" – can you be more specific?

7. p.8165, line 9 – advecting and morphing are not the same. The morphing includes growth and shrinkage, sort of. These techniques are called "motion-based techniques"

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later in the paper, but you should use that wording here since they aren't "blended" in the same way that, for example, TMPA is.

8. p.8166, bottom – "a degree of error" is somewhat ambiguous – do you mean substantial error? The 15 min and 1 min availability of GEO observations doesn't apply to all GEO satellites, but that's not clear here.

9. p.8167, top – HydroEstimator provides useful flood information for many other places beyond the US – Central America, for example. Please provide a reference for a comprehensive hydro-meteorological database that uses satellite precipitation estimates.

10. p.8167, lines 10-12 – Kidd and McGregor may have exploited the capability of TRMM PR to provide long-term measurements, rather than demonstrated it.

11. p.8168, line 25 – You say several studies concern snow retrieval but you list only one. Maybe list another, such as Evans et al. (2005).

12. p.8168, line 12-13 – Use of the word "biases" implies that you know the truth. In fact both GPCP and NCEP reanalysis have (unknown) bias error, so maybe "differences" would be a more appropriate word.

13. p.8169, line 18 – gauge and radar data sets also depends on the location, as they're not available everywhere.

14. p.8170, line 11 – satellite techniques better capture the location and timing of convection, which is a bit different to the nature of convection When you say, "warm-season performance studies tend to favor the satellite techniques" that implies that in winter the NWP models are better, while in the previous sentence you included motion-based techniques (which are satellite) in the better performers. This could cause confusion if people think motion-based techniques aren't satellite techniques.

Technical corrections

1. p.8162, line 6 – define epsilon here as emissivity.

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2. p.8164, line 6 – define Tb as brightness temperature.

3. p.8169, line 13 – it is the performance of the algorithms that depends on common underlying factors

4. p.8171, line 21 – do you mean included rather than encouraged?

5. p.8172, line 5 – this is not a complete sentence.

More technical corrections are provided on the attachment (conversion of PDF to RTF with track-changes)

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/7/C4765/2011/hessd-7-C4765-2011-supplement.zip

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 8157, 2010.