

Interactive comment on “Validation of the METEOSAT storm detection and nowcasting system Cb-TRAM with lightning network data – Europe and South Africa” by T. Zinner et al.

T. Zinner et al.

tobias.zinner@lmu.de

Received and published: 6 May 2013

Dear Referee,

thanks for your comments. I knew before that my English is not perfect. Anyway I was a bit surprised by your "major revisions" for language reasons. Anyway, I tried to use the chance to learn a few things about German English which I was not aware of. We put much effort in improving the language. After my own revision along your comments, our South African co-author (second language experienced English speaker) and a native speaker here at our institute did a language check.

I hope it's more readable now.

C772

Please find my replies ("->") to your comments below.

Best Regards, Tobias Zinner

Editorial Comments:

Acronym DLR should be expanded (not every reader may be familiar with this) -> done

Acronym SAF should be expanded (not every reader may be familiar with this) -> done

References to sections should be consistent (sometimes Sect., sometimes Section) -> done.

References to Figures should be consistent (sometimes Fig., sometimes Figure) -> done.

Spelling should be consistently UK or US English (e.g. vapour or vapour, colour or color, but not both) -> done. I'm very sorry for all the little spelling neglects. This should have been smoothed beforehand.

In the introduction (line 8 on page 1271) "Moreover, satellite data generally allows for ..." should be "Moreover, satellite data generally allow for ..." -> As far as I know, this is personal preference. Data can be both, singular and plural. We changed it to singular throughout the manuscript.

In the introduction, line 11 on page 1273, the sentence "The following expands work started in Zinner and Betz (2009)" is not quite clear to me (what is the "following"? Certainly not the following paragraph?). Or is there a word missing? -> Changed to: "The work presented here extends a previous study of ..."

Typographical error in line 8 on page 1273 – "criteria" should be "criteria" -> Could not find this typo. Anyway ... done via automatic spell check.

Section 4, line 20 on page 1279 "contiguous" should probably be "contiguous" -> done.

C773

Line 23 on page 1280: "... red colored areas in constitute ..." – the "in" should be deleted (or expanded) -> done.

Typographical error on page 1281, line 3: "al.owed" should be "allowed" -> done.

Line 16 on page 1281: "the overall activity is to be expected clearly higher..." sounds a little awkward, why not "The overall activity is expected to be clearly higher" -> Thanks. Changed.

Line 11 on page 1281: "... i.e. the network less sensitive..." should be "the network is less sensitive" -> done.

Line 19 on page 1285: "... only 10 % of all Cb-TRAM detected pixels contain sl intense ..." sl? -> removed "sl". Should have been a "\sl" tex command.

Line 14 on page 1287: "one the one hand .." should probably be "On one hand ..." -> You want me to correct "one" to "on", I suppose? Corrected the typo. Also removed "the" from the phrase, as you requested. Although ... "on the one hand"/ "on the other hand" seems to be the correct phrase one finds in most dictionaries. "On one hand" seems to be a more colloquial version.

Line 17 on page 1287 "... (not shown). an adjustment ..." should probably be "... (not shown), and adjustment ..." -> Corrected.

Line 21 on page 1287 "necessarly" should be "necessarily" -> done.

Line 17 on page 1287 "Figure 6..." should be "Figure 6 ..." -> Corrected "Figures 6" to "Figure 6" on line 27?

Line 10 on page 1288 : "On the one hand ..." should be "On one hand ..." -> See above.

Spelling of "day-time" and "night-time" should be consistent (sometimes "day-time", sometimes "daytime" is used, resp. "night-time" vs. "nighttime" or even "night time") -> Sorry for that. Corrected.

C774

Paragraph starting at line 10 on page 1292: This sentence is very difficult to understand – for language reasons ("given the fact that" should be generally omitted as it is meaningless, "majority of all ..." makes no sense – either majority or all, and "warned of" does not exist. Suggestion: "All these quality scores, especially for the daytime detection scheme and the shorter range forecasts, are very encouraging. Warnings can be issued for the majority of strong and potentially harmful cells, while only few warnings would affect cells with no mature convective activity. -> Adopted your suggestion to simplify the paragraph's wording. Interesting is your comment that "warned of" does not exist. It might be an awkward use on my side, but following several dictionaries it does exist with the meaning intended "to warn of danger". "majority of all" and "given the fact that" might be useless phrases. I agree. Still they exist and are used in abundance on the English speaking web.

Line 15 on page 1291: "... are decisively depending on ..." should be "crucially depend on ..." -> corrected.

Line 20 on page 1292: "... probably most direct and objective measure ..." should be "... probably the most and direct measure ..." -> Added "the", if that is what you intended?

Line 28 on page 1292 "... these lead to slightly better ..." – what does "these" refer to? -> Added "differences" to make it clearer. New sentence: "Reasons for the slightly better skill values for South Africa might be a combination of these differences and the climatological characteristics of thunderstorms there. The typical South African locally triggered multi-cell thunderstorm is more likely to be detected from a satellite perspective than many European storms which are triggered by and embedded into fronts."

Lines 3-4 on page 1293: "... if ... would be included." should be "... if ... are included." -> done.

Technical / Scientific comments: (1) In section 2, the use of the HRV channel reflectivity is mentioned, but no information is provided on how a changing sun angle is

C775

accounted for. Information that only sun angles up to 75 deg is given later in the section, but should be provided the first time this daylight concept is mentioned. -> Now all dependence of HRV on SZA is summarized in one location in section 2 preceding the detail descriptions.

(2) In section 3.2, a reference to Figure 3 is missing. -> Added.

(3) In section 4, lines 1-2 on page 1280: "Several definitions of what a good storm detection has to identify are imaginable". Being at the end of the paragraph describing the collocation between satellite pixels and lightning events, this sentence comes as a little surprise as it seems out of context. Is it supposed to be an introduction to the next paragraph? If yes, it should be moved to the next paragraph. -> Moved to next paragraph.

(4) In section 4, lines 15-20 on page 1280: I don't see how the numbers of "intense lightning activity" add up: If the threshold is 0.01 flash reports per square km and minute, then for a Meteosat pixel of 20 square km size and for a time period of 15 minutes this should be $0.01 * 20 * 15$ which is 3 and not 10. -> Corrected, thanks. It should have been "0.035 flash reports per square km and minute". This is derived from "5 flash reports with 3 km radius and 5 min" and translates to "approximately ... 10 per Meteosat pixel and 15 min".

(5) Line 25 ff on page 1281: "... lightning detection as CG or IC, which is done via an imprecise height detection for both networks, ...": This is not clear: Are the "both" networks the European an SA networks? And if yes, it was written before that the SA network does not detect IC events? Please clarify! And then in the following sentence the authors talk about a "detection efficiency" – is that for CG events only? -> Clarified. The SA network does not expect to detect IC events due to lower sensitivity, but does not try to identify IC or CG. It "is supposed to provide primarily CG recordings" (sect. 3.2). New text: "Unfortunately the problematic characterisation of lightning detections as CG or IC makes it difficult to make such an adjustment accurately. The character-

C776

isation for the European network is done by means of an imprecise height detection and this information is not provided for the South African network at all. In addition, a first analysis does not show any clear difference in the overall detection efficiency for the European and the South African network."

(6) Page 1284, last paragraph, starting with "Once a CbTRAM object has reached the mature stage ...": This paragraph is very unclear. First the authors state that nowcasts up to 60 min are also investigated (whatever "investigated" here means) – and then the paragraph concludes by saying that only the 15 time frames are considered. A little bit of language clarification here would help. -> Clarified. I removed the confusing "...we could have completed the analysis..." sentence that describes only an alternative path which we didn't follow. New text: "Once a Cb-TRAM object has reached the mature stage, the nowcasts of this object's position up to 60 min into the future are investigated too. For simplicity, we apply the approach presented above to compare nowcasted positions against the measured lightning activity (in 15 min time frames around the forecast times 15, 30, 45 and 60 min)."

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 1269, 2013.

C777