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Interactive comment on “Development and verification of a real-time stochastic precipitation nowcasting system for urban hydrology in Belgium” by L. Foresti et al.

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Review hess-2015-220 Foresti et al.

This paper, which is a further development of the STEPS package, is carefully written and painstaking in its analysis of the effectiveness of the forecasts for two events - a stratiform one and a principally convective one. The results are encouraging and potentially show that useful short term forecasts can be made for management of flooding in urban environments. The prose is technical, but well explained, is intelligently compiled and presented, however is certainly not a tutorial! It makes a valuable contribution

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to the armoury of real-time heavy rainfall forecasting. That said, I have some queries so will follow this discussion with a list of things that I think need attention.

I recommend publication after minor revision.

Geoff Pegram 11 September 2015

In detail, by page & line number:

6836, 4: 512x512 kilometer?

6837, 2: does the compositing algorithm select from the lowest CAPPI, at what level, and what about the bright band? I think more detail is required.

6841, 24: 'a series of blocks' of what size?

6842, 10: 'previous' in place of 'last'

Same page , 17 - 19: The sentence 'Since ... radars.' Needs rewording

6843, 6: 'that' in place of 'the one'

6845, 6: 'field vectors based on the observations and then' in place of 'field vectors and'

Same page: It would help the reader if the last sentence (omitting the word 'More') i.e 'Details about the forecast verification setup and scores are given in Appendix A.' was placed after 'scores.' in line 10

Same page, 25: comment - It is not clear to me what the figures show - is Fig 2(a) showing the average of 30 min accums over 35 hours? Please revise the text as it is muddling. Aha - I get the explanation in line 17 on the next page

6847, 5: 'Contrary to expectation' in place of 'Contrarily to the expectations'

Same page [lines 8, 12, 25] and elsewhere, the use of the word 'comprised' is not good

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grammar in this context - in many cases it can be omitted.

6848 last sentence. That makes sense, so the model is good, but please check my remark below on the passage on page 6853, lines 4 & 5.

6849, 14: 'likely' in place of 'sufficient' ?

6850, 7-9: this last sentence is a result which makes good sense

Same page, 20: remove 'the' before 'highest'

6851, 13: 'grows' in place of 'augments'

Same page, 16: 'lowest cascade level' I thought that the highest spatial frequencies were in the top level of the multiplicative cascade ...?

And 21: 'comprised' again - please remove

6852, 2: ' .. of the two stratiform cases' please add 'as might be expected'

Same page, 17: a comment. Overall, what is the summarised take-home message of this complex and compact paragraph? In my opinion, it is a bit abrupt and needs another sentence or two, drawing conclusions, before the overall 'Conclusions'

6853, 4-5: 'an improvement to generate 5 stochastic noise only within the advected radar composite'. Please remind me - is the noise variance linked to the reflectivity - i.e. is a constant noise added to the log of reflectivity? If not, the low rainfall values will be penalised. In fact, the low rainfall values will be biased upward and spoil the error scores ...

6854, 16: 'Fi is the forecast rainfall accumulation' is this over the whole field? It seems from Figure 4 this is done per pixel, so needs a mention.

6858, eq (8): why not just square the first bracket under the square root sign?

6859, 13: 'is not enough dispersive to' should read 'is not dispersive enough to'

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