



Interactive
Comment

Interactive comment on “Evaluating the extreme precipitation events using a mesoscale atmosphere model and satellite based precipitation product” by I. Yucel and A. Onen

Anonymous Referee #2

Received and published: 14 January 2014

This paper reports a comprehensive performance analysis of the WRF model (with and without data assimilation) and satellite-based Multi Precipitation Estimates (MPE) algorithm in estimating the characteristics of a number of recent extreme rainfall events occurred in the western Black Sea region of Turkey. The study considers 25 heavy rainfall events resulting in floods. The evaluation of the model and algorithm outputs is performed against the observations from 34 precipitation stations in the region. The authors also test the WRF model to determine the optimal physics configuration and find that the Kain-Fritsch cumulus and Lim-Hong microphysics schemes produce better rainfall estimates for the region. According to the comprehensive performance assess-

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ment, the main conclusion of the study is that the WRF model with assimilation gives better results than the WRF without assimilation, and that the performance of the MPE algorithm is relatively low in comparison to the performance of both WRF configurations (with and without assimilation).

This study tackles the important issue of accurate short-term flood forecasting in a region where heavy rainfall and flooding events have destructive consequences. Therefore, the study is a worthwhile contribution to the flood-forecasting application as well as literature. The subject of the paper is important and suitable for the publication in the journal. The methodology, data and analysis, which use several different statistical measures, are robust. The manuscript is well written. The presentation is sufficiently concise and well organized. As a conclusion, I recommend publication with only a few minor changes/additions as follows.

A new title should be considered, e.g. "Evaluating a mesoscale atmosphere model and a satellite based algorithm in estimating extreme rainfall events in northwestern Turkey".

Page 3 - 3rd line in section "2.1 Study area and data": Icelandic low is of maritime origin, not of continental origin.

Page 3 – 6th line in section "2.2 WRF modelling system": "The model was initiated . . ." Is there a rule for the model initiation time for each event? Is WRF initiated on the same day the event starts?

Page 5 – 4th line in section "3.1 General analyses": "Assimilation provided perfect match . . ." Use "a very good" or equivalent instead of "perfect".

Page 6 – 3rd line in the 2nd paragraph in section "3.2 Event- and Station-based analyses": replace "errors" with "errors".

Page 6 – 12th line in the same paragraph as above: "In some cases shown in Figure 7a,b, the assimilation degrades precipitation against observations because of the

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chaotic status of the atmosphere” This part is not well understood. Could you explain it further? How are the chaotic cases assessed?

Page 6 – Last paragraph: Could you include text to explain what the numbers (ranges) mean for POD, FAR and CSI?

Page 6 – Last line on the page: “... confirms an existing of systematic problem...” should be “...confirms the existence of a systematic problem...”

A few references are missing the reference section, e.g., Hong et al (1996), Lim and Hong (2010), Lin (1983). Please check the references thoroughly.

Table 4 caption: Please explain what “conditional rain” means in the caption, too.

Figure 6: Is it possible to make the fonts larger? They look very small.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 6979, 2013.

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