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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A complex aerosol transport event over Europe during the 2017 Storm Ophelia in CAMS forecast systems: analysis and evaluation" *by* Dimitris Akritidis et al.

Anonymous Referee #1

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This is a very well, and concisely written evaluation of the ability of the CAMS global and regional systems for forecasting a rather particular aerosol event, being a combination of high loadings of dust, biomass burning and sea salt particles. I find interesting to learn that the IFS forecasts excluding data-assimilation already show similar performance as the configuration including data-assimilation. Does this either point at a very good forecast model strength, or rather at deficiencies in the data assimilation setup?

I find it only unfortunate that authors only assess the first-day forecasts. This only a limited view of the forecast capability of the system is presented. It would have been very interesting if the authors would have shown the (likely decay in) forecast capability

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Discussion paper

for the second and third day forecasts, as this would give a better handle for 'citizens and policy-makes' on the reliability of forecasts on a time scale where they are able to take action, which is one of the key objectives of this study. Is it possible for authors to make statements on this?

Apart from this, I only have some small comments.

Page 4, l 10L 'day-1 forecasts'. Are these the forecasts initiated at 0h00? Just because the CAMS operational system provides currently two forecasts per day.

Page 4. The authors provide empirical formulae to compute the PM10 and PM2.5 concentrations from the global system, which are crucial for the definition of the contribution of aerosol to the air quality statistics. These equations appear rather empirical, and also different depending on the model version. Can the authors give some more background information as to how these metrics are designed? Also, to what extent does the definition of this metric contribute to differences seen in Figure 8?

Page 5, l3: "CAMS regional models assimilate PM10 and PM2.5" : does this hold for all CAMS regional models, or only for some? Also, are PM10 and PM2.5 the modeled tracer fields in the regional models, or are they computed from underlying aerosol composition fields, as is the case for the global model? In summary, could the authors elaborate a little more on how PM is modeled in the regional system?

page 7, line 26: "reducing the bias"-> reducing the error

page 8, line 1: "the percentage" -> the modeled percentage

page 10, line 30: "implementation": I would rather write "application".

page 11, line 9: "The CAMS regional system seems to better predict the. . .." : why not write something like: "for this event the CAMS regional system shows better .."

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