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## ***Interactive comment on “Online coupled regional meteorology-chemistry models in Europe: current status and prospects” by A. Baklanov et al.***

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General comments.

This is a very important, impressive and useful paper which will be a benchmark for the coming years on the subject of on-line coupled regional meteo-chem models. I would like to congratulate the authors with this major achievement

Specific comments.

-Although it is implicitly clear that the subject concerns the troposphere, I would like to suggest to make this explicit in the Introduction. There are also on-line models for the troposphere and stratosphere. -Although the size of the paper is already impres-

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sive, I would have liked to see more text and information under 4.7.2, Wet and dry deposition. The important subject of which land use/land cover data base to use is not mentioned ( large impact on dry deposition). Wet depositions is a very important sink for aerosols, and its treatment in the models is associated with many uncertain aspects, of which rain, where and how much, might be the most important -Under 6.3, Model evaluation, I would have liked to see, for example on page 12614, text concerning the inherent problem that by evaluating for example calculated PM 2.5 concentrations of an online model with observations, it is nearly impossible to determine by which process the calculated concentrations are influenced, by emissions, or by the feedback through clouds, etc. In my opinion the methodology by which results of an online model can be evaluated is still missing. Maybe the way forward would be detailed evaluation of processes in the model, with also using ratios of calculated concentrations for evaluation, for example EC/PM 2.5, and NO<sub>2</sub>/PM 2.5 -Under 7. Conclusions and recommendations, my impression is that here and there aspects are mentioned that have not been addressed in the paper before, like under 7.2.1 Emissions, the aspect of emissions from ships and aviation. Maybe these items could be listed explicitly under "important items not addressed before. -Under 7.2.1 meteorology-dependent emissions are mentioned. I miss the meteorology-dependent anthropogenic emissions like house-hold heating -Most of the tables are very useful and informative. I do however have a problem with table 1 and 2, on page 12695. Here the words : modulates, controls, determines, affect, influences are used. This gives the impression that a kind of grading of strength of impact is behind these words, controls is stronger than influences . However, the use of these words is not consistently in the tables,. I would suggest to have a careful look to the use of these words, and make it consistent.

#### Technical corrections

-page 12545, line 6. OCMC is used without clarification -page 12546, line 20 stated "definitely improves". I would suggest is expected to improve -page 12548, line 20 and 24. I have problems to understand the sentence "mechanisms of altered meteo-

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rology impacts on meteorology, and altered chemistry impacts ob chemistry. Could it be something like : by which altered meteorology has an impact on other meteorological phenomena. -page 12551, line 13 gives online access models, but the definition comes later, under 3.2. -page 12555, line 6, please add nitrate, ammonia. I also could not find a reference to table 5 somewhere in the text. -page 12559, line 2 add a in generate a code and line 3 , a numerical solver -page 12560, line 13, why is and evaporation between brackets? -page 12583, the text of line 13-18 is already on page 12549 . And line 25 gives the word exacerbate, do you mean increase? -page 12589, line 12, at large in stead of a large -page 12591, line 26, "and to be developed" should be removed -page 12596, line 22, better background then clean air -page 12597, line 3 and 20, background instead of clean -page 12600, line 21, reference to table 4 should be table 5 -page 12614, line 26 stated : not employ much data assimilation to allow for model internal feedbacks: I do not really understand the sentence -page 12618, line 1. What is meant exactly by drag interaction? -page 12627, line 22, COT is not defined -page 12703, table 7. Under approach the word mixed is used, it means model and sectional? And also mass only is used, the text gives bulk

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