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Interactive comment on "A multi-model comparison of meteorological drivers of surface ozone over Europe" *by* Noelia Otero et al.

Anonymous Referee #1

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The authors discuss an important question in air quality modeling, i.e. the capability of model results in reproducing several features of ozone time series. To this end, they compare observations with several state-of-the-art models. I think this issue is important and worthy of discussion, but I also think that the paper needs major revisions before it can be accepted for publication. First of all, I suggest to better balance the length of all sections; the introduction is too long but fails to highlight what has already been previously achieved and what are the main advances of this paper. What is really new with this work?

A second major concern is about the use of observations. As I can guess, the authors interpolate observations over a regular grid, but this introduces an additional problem. What is the representativeness of area-averaged observations? Usually, the support

of point observations is much more limited than $1° \times 1°$ grid cells. How the authors address this issue? Why not use a much simpler approach consisting of the comparison between observations and interpolated model values? As I can guess, Airbase observations contain several different station types (e.g. remote, suburban, urban, etc.). How are they treated?

A third comment concern the use of multiple models. The authors use a suite of model values, but they do not refer to any ensemble. I'm curious to know if an ensemble treatment may help in this case.

Finally, I also suggest a deeper analysis of the regression model. The authors implicitly assume a homoscedastic behavior. Is this supported by data? Due to the large interval of values and intrinsic periodicities in time series, I think that the variance cannot be assumed independent on model values. I suggest investigating on data properties, as well as on independence between the beta's values between different models and areas.

Typos: line 23: "ENE" should be "ENEA" line 161: "van Lon" should be "van Loon"