

Interactive comment on “The Mt Cimone, Italy, free tropospheric campaign: principal characteristics of the gaseous and aerosol composition from European pollution, Mediterranean influences and during African dust events” by Y. Balkanski et al.

Anonymous Referee #1

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General comments: This paper focuses on the investigation of the causes for the low ozone concentrations at Mt Cimone. Is it advection of poor ozone from Africa or ozone loss along the way to the receptor due to heterogeneous reactions on the surface of dust particles? Decreased photochemical ozone production due to the presence of dust clouds or limited ozone production due to low NO_x availability? This is a topic of interest and the authors address here only the first hypothesis and present adequate supporting material for their conclusions based on their model calculations with LMDZ-INCA model and the back trajectories with the FLEXTRA model. However, I believe that the manuscript needs major revision before publication. The paper mainly needs a

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restructuring with the major findings and conclusions of the campaign clearly outlined in order to serve as an overview article in an adequate way and I would suggest the authors to give some effort to integrate all this information within the overview article.

Specific comments: My major concern is that the way that the manuscript is structured looks unbalanced because on the one hand aims to give an overview of the whole experiment and on the other hand tries to answer a specific question concerning the causes for the low ozone concentrations at Mt Cimone. If the manuscript serves as an overview of the experiment (which as far as I understand is actually the case) then there is no adequate discussion of the main results and conclusions of the campaign about the principal characteristics of the aerosol composition for different source regions. For example in Table 1 there is a number of measurements concerning aerosol chemistry, aerosol physical and optical properties but within the discussion of the manuscript there is no or minimal reference on the results from these measurements except for the identification of the dust events and Figure 1. Also there is no description of the meteorological situation during the intensive campaign. If the manuscript does not present an overview of the experiment I believe that the title should be adjusted in order to represent a clearer focus of the paper. In this case the authors cannot claim that in this paper they look only on the first hypothesis (advection of poor ozone from Africa), while the role of heterogeneous reactions is discussed by a companion paper. It should be actually one common paper, which will address the role of heterogeneous reactions on ozone concentrations (as mentioned in this manuscript) as well as the role of advection. Furthermore if the manuscript is not an overview then some parts of the paper may be omitted as irrelevant. For example in this case Table 1 is not necessary or in Section 1 there is description for measurements, which are not presented later on. Finally I would suggest omission of the word "during" in the title: The Mt Cimone, Italy, free tropospheric campaign: principal characteristics of the gaseous and aerosol composition from European pollution, Mediterranean influences and "during" African dust events"

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