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Interactive comment on "An investigation of ozone and planetary boundary layer dynamics over the complex topography of Grenoble combining measurements and modeling" *by* O. Couach et al.

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Interactive comment on "An investigation of ozone and planetary boundary layer dynamics over the complex topography of Grenoble combining measurements and modeling" by O. Couach et al.

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This paper concerns an evaluation of ozone (O3) and planetary boundary layer (PBL) dynamics over the complex topography of the Grenoble region through a combination of measurements and mesoscale model (METPHOMOD) predictions for three days,

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during July 1999. By visual inspection (Fig 11) the regional model METPHOMOD yields comparative results wit LIDAR measurements, at least for three of the four data sets presented. The paper would benefit from a short discussion about the representative less of the relative short periods results for a more general assessment of the model performance. Also, METPHOMOD has been evaluated in more traditional evaluation programs, a reference would be appreciated.

This paper goes beyond usual evaluation because most photochemical models are usually evaluated only with respect to ozone measurements. But how does this model compare with traditional ground-based ozone- also from other studies? We refer to a critical review of photochemical models and modeling (Russell and Dennis, (2000). "In fact we most likely know less than we think about the systems we are simulating; we probably cannot distinguish when a model is performing well or not; and we surely cannot say why the model is or is not performing well. What is clear is that model evaluation should go beyond comparison of a single (or two) species with a limited set of measurements."

Have results been obtained for other spices than Ozone, then please show them? Also , the paper would benefit from presenting the statistical parameters from the three day analysis inpercomparison with Lidar data, so the intercomparison becomes quantitative.

AUTHORS REPLY

Metphomod model has been evaluated quantitatively, see "Perego, S.: Metphomod - a numerical mesoscale model for simulation of regional photosmog in complex terrain: model description and application during Pollumet 1993 (Switzerland), Meteorol. Atmos. Phys, 70, 43-69, 1970 ". The base case period validation was largely presented and discussed in the paper "Couach, O.,et al. : Study of a photochemical episode over the Grenoble area using a mesoscale model and intensive measurements, Pollution Atmosphérique, 174, 2002a". We consider that three-day period simulation as large

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enough for being representative for Grenoble region including both north and south synoptic winds regimes.

The ozone is not the only ouput of the model. The meteorological parameters as well as NO2 and HCHO (see Jiménez, R., O. Couach, F. Kirchner, I. Balin, V. Simeonov, B. Calpini, and H. Van den Bergh, Dynamics of formaldehyde in the Grenoble region (France) during GRENOPHOT 1999 : an observational and modeling investigation, J. Geophys. Res., Submitted, 2003) were calculated on 3D, which is at our knowledge an achievement compared with classical base case validation for photochemical models.

The statistical parameters and the complete analysis of the measurement campaign was not the goal of this paper but can be found in the final report campaign of GRENOPHOT, http://lpas.epfl.ch/lidar/publications/repports/RapGrenophot99.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 3, 797, 2003.