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Geoscientific Model Development Discussions

Interactive comment on "Evaluation of ECMWF IFS-AER (CAMS) operational forecasts during cycle 41r1 - 46r1 with calibrated ceilometer profiles over Germany" *by* Harald Flentje et al.

Anonymous Referee #1

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General comments

This paper is on the evaluation of the prediction of aerosols by the air-quality AQ model of the European for Medium-range Weather Forecast (ECMWF) using the ceilometers of the German operational network (CHM15) and observation of the chemical composition of the air done at the station of Hohenpeissenberg (HPB in short). The paper presents the various sources of data, explains the metrics used for the evaluation, and tries to explain the probable origin of the discrepancies observed between the various data sources. This is an interesting paper that points to defaults in the model and give paths to improvements. The observation data span a long, 4-year period, so the statis-

tics are climatologically relevant. The paper contains many results. Its reading is not easy because of the wealth of results on one hand, but also because acronyms sometime appear that have not been introduced (see for instance OM in line 21 on page 1) and several figures are definitely too small for an easy reading (see below). With a few corrections, the reading should become easier. I think the paper deserves publication after minor corrections because of its great interest for AQ model developpers.

Minor comments: Page 1, line 1: OM has not been introduced before. Page 3, line 58: same for BB. Page 7, line 210: according to the Rayleigh scattering theory, the ratio alpha_m/beta_m is strictly equal to 8\pi/3 (not approximately equal). Page 7, last line: the equation is incomplete. Page 9, figure 1: the legend should say specifically that pink dots are stations with 0% of data. Page 11, lines 305-308: the sentence is not clear. Page 11, line 333: the meaning of O(z,t_i) is not explained. Page 14, figure 2: The label on the y-axis of the bottom figures is wrong, it should be % Page 23, figure 5: I think the unit on the y-axis of the middle graph is wrong (should be no unit). Page 25, line 555: the meaning of HPB is given in line 560. Page 27, figure 7: the legend on the graphs is too small. Page 27, line 579: Should be HPB instead of HPS Page 30, figure 8: the graphs are too small. Page 39, line 841: Okt -> Oct.

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