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**Geoscientific
Model Development
Discussions**

Interactive comment on "Evaluation of the parametrized transport of lead-210 in high-altitude European sites" *by* I. Dombrowski-Etchevers et al.

Anonymous Referee #1

Received and published: 28 April 2009

This paper presents a simulation of 210Pb using two different resolutions of the model MOCAGE. A first resolution is of 2 degrees outside Europe and 1 degree inside, a second resolution is 4 deg. over the globe and 1/2 degree over Europe.

Major points:

- This work could be a very valuable contribution if the analysis of the variability of the concentrations of 210Pb and their agreement with the observations was contrasted for the 2 different resolutions. Unfortunately, the comparison focuses on 5 sites and the variance of the model concentrations is discussed quatitatively but not quantitatively. The reviewer would have liked to see the changes brought about by the 2 different resolutions on the monthly mean concentrations presented in FIgure 2 for 32 stations of the Northern Hemisphere. Furthermore, when the authors present the time series

of 210Pb concentrations at the 5 altitudinal sites (Sonnblick, Shauinsland, Aveiro, K-pustza and Puy de Dome) where weekly measurements have been acquired within the CARBOSOL project, they could have quantified the standard deviation of the measurements to compare it with the one from each of the model version. That would give them an overview of the ability of a finer resolution to represent better or not the short-term/scale variability of this tracer.

- The English language should be polished up. It seems to me that the co-authors did not do the part of the work that is incumbant on them to detect these inprecisions.

- In paragraph 3.3, the authors could have tested the representation of the planetary bondary layer height for a possible explanation as to why the amplitude of the seasonal cycle is weaker in the model than in the observations.

These points should be addressed and the manuscript improved before it can be re-submitted for publication.

Minor points:

Line 13, p. 251: "and nullifying at 70°N" should be corrected.

Line 1 p 252: "whashout" should be "washout"

Line 11 page 252: "appoximately 5 days" should be replaced by "5.5 days"

Paragaph 2.2: The last 20 lines of page 253 and the first 17 lines of page 254 need to be rethought through. I had difficulty folowing what the authors meant.

Page 255, line 16: replace "Altitude sites provide very intesting insight..." with: "Altitude sites provide a very intesting insight..."

page 255, line 18: replace "have for instance use historical data" with "used historical data"

page 260, line 6 change 'still to coarse' with 'still too coarse"

The expresstion "This choice in fact implies that" line 9 page 256 is awkward.

Interactive comment on Geosci. Model Dev. Discuss., 2, 247, 2009.