We thank Peter Haynes for the comments and suggestions on our manuscript. Please find our answers to the comments below (Editors's comments in **bold**, our replies in standard font, and modifications of the text in blue).

I have received one referee report on your revised paper -- that referee recommends that the paper is very close to being suitable for publication but questions your use of terminology -- in particular the use of 'plume' rather than 'cloud' which the referee believes will be very confusing to those in volcanic science community. The referee suggests a way around this -- to use the term 'volcanic cloud' or 'volcanic ash cloud'. Please consider using that -- or something similar -- and provide justification if you really strongly wish to use 'plume' -- but in that case I suggest that you insert a sentence that makes it explicit that you are using 'plume' to describe the passively advected ash/aerosol rather than the strong upward flow emerging directly from the volcano.

The focus of our paper is on the modeling of volcanic ash dispersion in the atmosphere. We therefore still prefer the term 'plume' instead of 'cloud' which is more common in the field of volcanology. However, we added the following sentence to the manuscript for clarification (L.64-66):

Throughout this paper, we use the term 'plume' or 'volcanic plume' to describe the part of the volcanic material dispersed in the atmosphere as commonly used in the meteorology instead of 'volcanic cloud' to maintain a clear distinction from the meteorological clouds.

With regard to the comments on the original paper by Referees 1 and 3 -- my impression is that you have provided thorough responses those but in some cases -- particularly with regard to comments of Referee 1 -- you have not made a change to the text. That is fine in principle -- there is no rule that says that a change to the text has to be made, and in the ACP system your responses to the referees will be publicly visible -- but I wonder with respect to some of the comments whether a change to the text would be helpful to the reader. (The referee is requesting more information on a certain point -- you have provided more information in the response -- but a reader might well have a similar question and benefit if a bit more information -- something brief -- is provided in the text.) Please can you look again at the responses and think about whether a sentence or two added to the text would help a reader of the paper, particularly if they were thinking in the same way as the referee.

We added the following:

- L. 137-143
  We only used the MER from FPlume and calculated the very fine ash fraction and emission profile independently due to two main reasons: (1) based on offline analysis we figured out that the mass profiles for the predefined bin sizes strongly depends on the assumption of initial total grain size distribution (TGSD). As information on the TGSD is often lacking, using FPlume mass profiles lead to a less generic approach and large uncertainties. (2) the definition of ash modes in ICON-ART is only relevant for long range transport in the atmosphere and differs from TGSD at the vent. Thus, we would have to convert the FPlume size bins into ICON-ART mode which requires several assumptions and increases the uncertainty of the emissions.
- L. 308-313:
  We do not discuss the SAL values for the FPlume-norad and the Mastin-rad case here, because FPlume-norad only shows very small differences to the FPlume-rad case in all SAL

values and Mastin-rad only changes the amplitude value as only MER is higher compared to Fplume-rad. Based on the analysis of hourly to daily mean values, we conclude that 6-hour averages provide a reasonable compromise between both reproducing the details and reducing the amount of missing values and noise.