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Interactive comment on "Measurements of Aerosols and Charged Particles On the BEXUS18 Stratospheric Balloon" *by* Erika Brattich et al.

Anonymous Referee #2

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General comments:

This study reports the aerosol measurements obtained by the BEXUS18 stratospheric balloon flight. Its distinct feature is being equipped with ion counters. A role of ion chemistry in the stratosphere is still an open question and could be essential for the understanding of the atmospheric impact from the space. This topic is suitable for ANGEO. However, information on the instruments of aerosol and ion measurements is completely lacking in this manuscript, so that it is impossible to evaluate whether their observations are reliable or not. Thus I recommend a rejection of this manuscript. Detailed comments are given below.

Specific comments:

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Discussion paper

-Temperature and pressure measurements

The authors showed results of temperature and pressure measurement in Fig. 1, but it is found that their results are not so reliable compared to nearby radiosonde observation. Including a radiosonde in their payload does not look difficult, so that I am wondering why they did not do it. In addition, they used temperature and pressure data in their model calculation. Is it really meaningful to use such unreliable data? They need to show how sensitive their model calculation is to temperature and pressure errors.

-Aerosol measurements

Their aerosol instrument, LOAC, has been used in 150 flights, so that its precision, resolution, etc. should be well known. However, they did not give those information at all in the manuscript. Although they mentioned an existence of the thin aerosol layer with a thickness of less than 100m at p.10, l.25, I cannot judge whether this instrument has a vertical resolution high enough to detect such a layer.

-Ion measurements

They mentioned that the performance of their ion measurement was checked by preflight lab experiments, but it is not shown in the manuscript at all. Thus I cannot judge whether their ion measurements are reliable or not.

-Average

In order to show the aerosol data, they often used arithmetic mean/smoothing. Since aerosol density changes by several orders of magnitude, the arithmetic mean strongly depends on the largest value. Geometrical mean or median filter would be better to represent aerosol distributions.

-Figs. 3 and 4

What is dN/dlog(D) in Fig. 3? A caption of Fig. 4 does not correspond to Fig. 4 about

their y-axis.

-Eq. (3)

Units look different between the terms. Probably some variables are missing.

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