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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Fluorescent biological aerosol particle concentrations and size distributions measured with an ultraviolet aerodynamic particle sizer (UV-APS) in Central Europe" *by* J. A. Huffman et al.

Anonymous Referee #1

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Huffman et al. utilize an ultraviolet aerodynamic particle sizer (UVAPS) to measure the size and concentration of fluorescent particles for a long duration at a site in Germany. This is a well-written and very timely paper. The topic of biological particles, which are a sub-set of fluorescent particles, is of interest in many parts of the atmospheric science community. There currently exist insufficient data, especially over an extended time period, and this manuscript helps fill this gap. I have a few points that I hope can be discussed and which the authors should consider in a revised manuscript. The paper indicates that the UVAPS data provides a "lower limit for the actual abundance

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of PBAPs" (Primary Biological Aerosol Particles), e.g. Abstract and Methods. The authors give a solid description which includes the fact that some non-PBAPs can also fluoresce. Indeed, they attempt to remove some of these non-PBAPs to arrive at final concentrations and timelines. However, this discussion invalidates the claim that the UVAPS can be considered a lower limit for PBAPs. The authors can not claim to know the fluorescence properties of all atmospheric aerosol; therefore there is no way to definitively state that everything they measure is a PBAP (that is to say, they are removing certain groups of particles they know fluoresce but are not PBAPs; there is no way to say if they removed all groups). Indeed, without some other verification method such a statement is unfounded. Therefore, I suggest the "lower limit" statements be removed; simply state that this is a "best estimate". The term "diel" is used extensively throughout the text and figures. This is a rather uncommon term (not incorrect, especially in biological situations, but then not normally used in this manner in atmospheric). I would suggest "daily" be used instead. The results and discussion and the figures could be shortened substantially. Specifically, the description of number and mass concentrations is several pages each. The specific figures are then called out with more description. I suggest cutting this substantially. In particular, figures could be combined in multiple panels for number and mass (and size and mass distributions) instead of separating these. Please attempt to eliminate redundancy in the description.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17705, 2009.