

Atmos. Chem. Phys. Discuss., referee comment RC1
<https://doi.org/10.5194/acp-2021-300-RC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on acp-2021-300

Anonymous Referee #1

Referee comment on "Vertical profiles of trace gas and aerosol properties over the eastern North Atlantic: variations with season and synoptic condition" by Yang Wang et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-300-RC1>, 2021

The paper presents results of vertical profiles of gas and aerosol properties during ACE-ENA that were measured in summer 2017 and winter 2018. The combination of instruments onboard the aircraft (FIMS, AMS, SP2, thermal denuder, etc.) allowed for a thorough analysis of the impacts of seasonal differences, transport pathways, and synoptic situations on atmospheric composition (gas and aerosol) and aerosol microphysical and cloud-nucleating properties. It is well-written and an important contribution towards the understanding of factors controlling variability in aerosol properties, including CCN, in the eastern North Atlantic region. I only have a few very minor comments.

Line 127: Should be a lower cut-off size of 10 nm.

Figure 3 caption: Please describe what the 3 colors correspond to.

Line 157: Change to "North America"

Line 475: Should be 35 nm.

Lines 480 – 482: What does “mixing” refer to here?

It would be helpful to provide a brief description of what is meant by a decoupled MBL since it is an important topic in the paper.