High Concentration Aerosol Event Mask

Objective

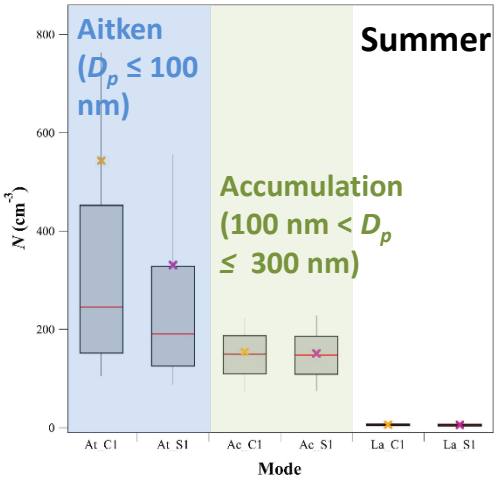
- Identify high concentration submicron aerosol events associated with local sources at the Eastern North Atlantic (ENA) ARM Central Facility (C1) Aerosol Observing System (AOS)

Approach

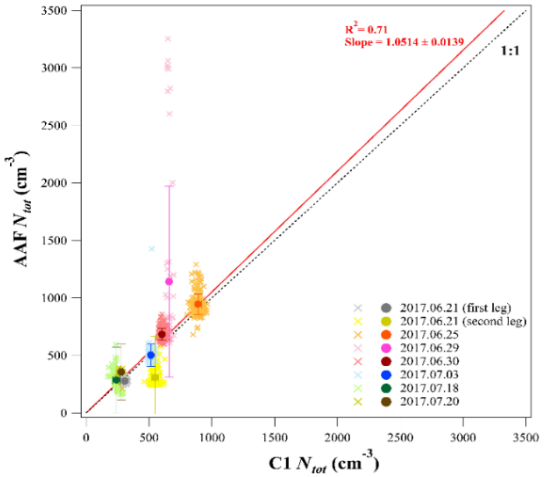
- Develop an algorithm to mask periods that do not represent regional aerosol
- Validate the mask with a temporary Supplementary site (S1), collocated measurements and observations

Impact

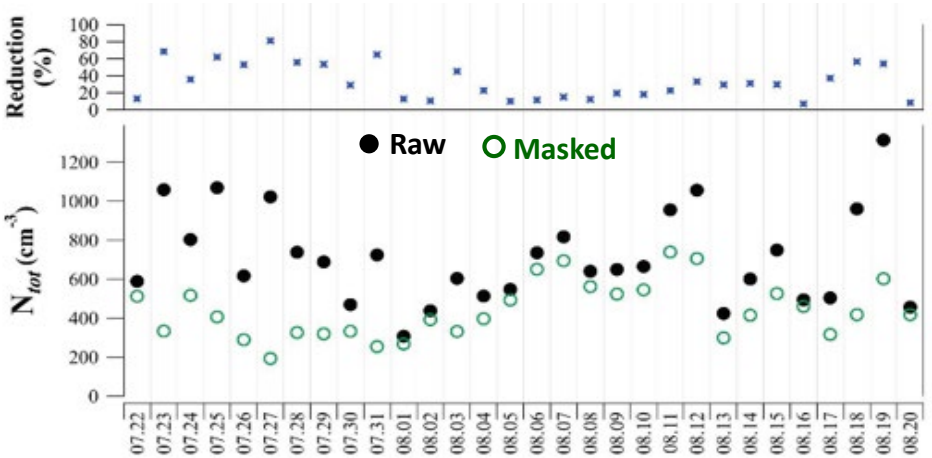
- Aerosol processes involving Total submicron or Aitken mode particles should be masked → Monthly means reduced by factors of 1.65 (Summer), 1.55 (Winter)
- Accumulation mode less impacted – reduced by factors of 1.07 (S), 1.33 (W)
- Can be applied to other Facilities



Box and whisker plot with mean (x) and median (-) # conc.



Masked AOS vs AAF total submicron number conc.



Daily mean submicron aerosol number concentrations and percent reduction after applying the mathematical mask

F. Gallo, J. Uin, S. Springston, J. Wang, G. Zheng, C. Kuang, R. Wood, E. B. Azevedo, A. McComiskey, F. Mei, A. Theisen, J. Kyrouac, and A. C. Aiken.
"Identifying a regional aerosol baseline in the Eastern North Atlantic using collocated measurements and a mathematical algorithm to mask high submicron number concentration aerosol events." *Atmospheric Chemistry and Physics*, in press. (2020) [DOI: https:10.5194/acp-2020-49]