

Review Sulo et al. “Coral emissions increase aerosol and cloud condensation nuclei over the Great Barrier Reef.”

The authors analyze multi-year in-situ measurements over the Great Barrier Reef, starting from seasonal differences in cloud condensation nuclei (CCN) concentrations and linking them to variations in aerosol size distributions. Using gradient boosting regression modelling, the authors estimate the contribution of Aitken-mode particles to CCN. I have reviewed this manuscript in another journal, and I recognized that this version has made substantial improvements compared to the previous submission. I recommend it for publication after minor revision.

Main comments:

- (1) The authors link high Aitken-mode fractions and air back trajectories to infer that the aerosol contribution is locally reef-derived new particle formation. But the particle number size distribution did not show any NPF events. The clear bimodal distribution shows the aerosol went through cloud processing and aging, which means the aerosol is from long-range transportation, not a local source. Could the author elaborate this?
- (2) The unusually high concentrations only observed in 2016 remain unexplained; the conclusion that springtime CCN enhancement is driven by local reef-derived NPF appears insufficiently justified. Why will ENSO affect the variability? I am still missing the logic chain between ENSO and CCN variability.
- (3) Abstract, the fonts of some text are different from the others.