Investigating the influence of volcanic sulfate aerosol on cloud properties using MODIS data along A-Train tracks.

Jay Mace
Sally Benson, Peter Gombert

Methodology: During A-Train overpasses near volcanic islands, identify back trajectories that pass close to the volcano.

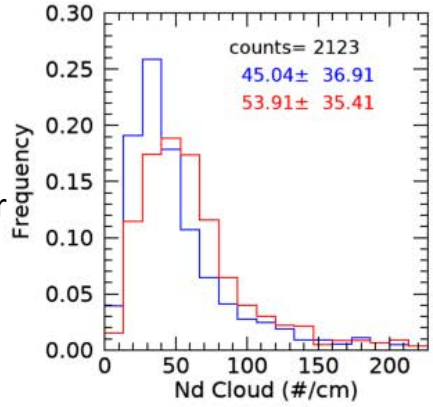
Divide A-Train overpasses into high aerosol optical depth (i.e. active SO_2 release) and low aerosol optical depth…

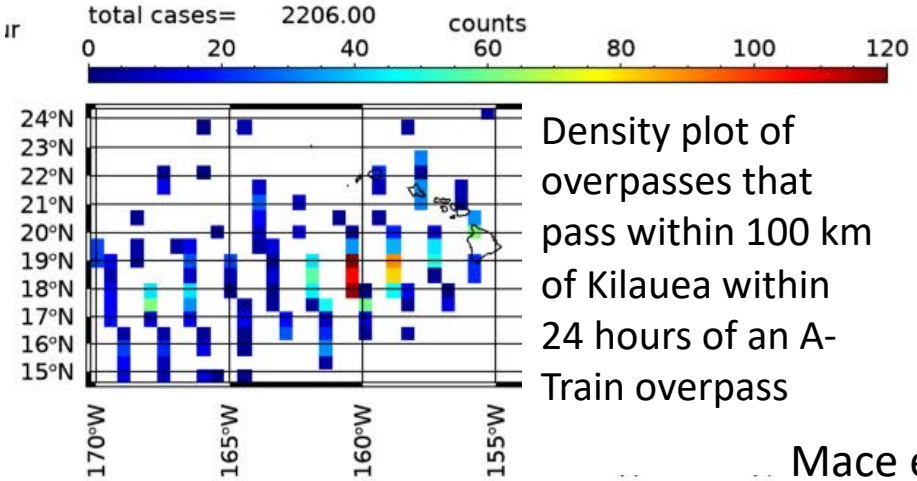
Finding: In high AOD volcanic plumes:

- Clouds are also deeper and have higher cloud fraction.
- higher cloud droplet numbers
- smaller precipitation effective radius.

Objectives: Quantify the differences in shallow convective cloud properties downstream of subtropical volcanic island using A-Train data when volcanoes are and are not emitting SO_2

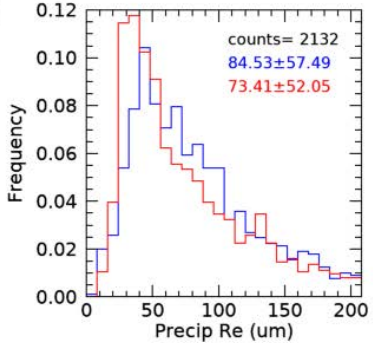
Cloud Droplet number High AOD (red)





Density plot of overpasses that pass within 100 km of Kilauea within 24 hours of an A-Train overpass

Precip Efffective Radius - High AOD (red)



Mace et al. 2022 (in prep)

Exploring Cloud Droplet Number Variability in the High Latitude Oceans

data along A-Train tracks.

Jay Mace
Sally Benson, Peter Gombert, Elizabeth Sterner

Objectives: Use MODS L2 to quantify the statistics of Cloud Droplet Number Concentration (Nd) seasonally in the high latitude Southern Ocean.

Explore processes behind these statistics using A-Train data

Methodology:

Identify non-precipitating low level liquid phase clouds scenes in MODIS L2 data.

A scene is a 1x2 lat/lon region with primarily low non-precipitating liquid clouds

Construct the geographic distribution of high and low Nd cloud scenes in the Summertime Southern Ocean..

Finding: the highly biogenic productivity regions near Antarctica have an anomalously high occurrence of high Nd clouds

Geographic Distribution of High Nd scenes in the summer Southern Ocean