

***Interactive comment on* “Does precipitation susceptibility vary with increasing cloud thickness in marine stratocumulus?” by C. R. Terai et al.**

Anonymous Referee #2

Received and published: 10 January 2012

The study uses data from VOCALS observations of marine stratocumulus collected near the west coast of South America to investigate effects of aerosol concentration on precipitation susceptibility. The authors aim to separate the microphysical effects of aerosols from the macrophysical factors by stratifying the dataset by cloud thickness (liquid water path). There is one caveat though when assessing the aerosol effects on precipitation. The aerosols actually can affect precipitation in two different ways: first through their concentration, because high aerosol numbers suppress supersaturation and, hence, precipitation formation. This effect is actually what was investigated in the paper. However, the aerosols can affect precipitation in a second way, i.e., through formation of rain embryos by large/giant aerosols. Because of the several orders of magnitude smaller concentration of large/giant aerosols, their contribution to the total concentration measured by the PCASP is negligible and, thus, the precipitation sus-

C14095

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



ceptibility studied in the paper will not reveal the effect of large aerosols. It is thus possible that for the same total PCASP concentration, the precipitation will vary depending on the presence and the load of large aerosol particles (larger than 1 micron), e.g. large sea-salt particles. The concentrations of the latter depend on the sea surface wind which is a macrophysical factor. It would be quite beneficial to discuss in the paper how the presence and magnitude of surface winds and large sea salt aerosols may affect the precipitation susceptibility and, possibly, the conclusions of the study.

p. 4 last para: For readers convenience please define in the text “cloud condensation nuclei proxy "alfa", and the “second formulation of susceptibility”.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 33379, 2011.

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)