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Effect of coarse marine aerosols on stratocumulus clouds

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In contrast to fine anthropogenic aerosols (radii $\sim< 0.5\mu$m), large aerosol particles are thought to enhance cloud droplet growth, promote precipitation formation and reduce cloud albedo. While shown in models, the impact of coarse aerosols on marine stratocumulus clouds lacks observational evidence. Combining satellite data from AMSR-E and MODIS, we link the amount of wind induced coarse marine aerosols (CMA), with droplet size of marine stratocumulus clouds over the southeastern Pacific. For constrained meteorological conditions, approximately 1/2 of the change in droplet effective radius (reff) is attributed to increase in CMA optical depth (τcm), as surface winds intensify. Accordingly, a twofold increase in τcm is associated with a 1.4μm +/-0.11 increase in reff . Our results suggest that any attempt to quantify the impact of anthropogenic and biogenic marine aerosols on marine boundary layer clouds, should take into account the opposing effect of wind induced coarse marine particles.