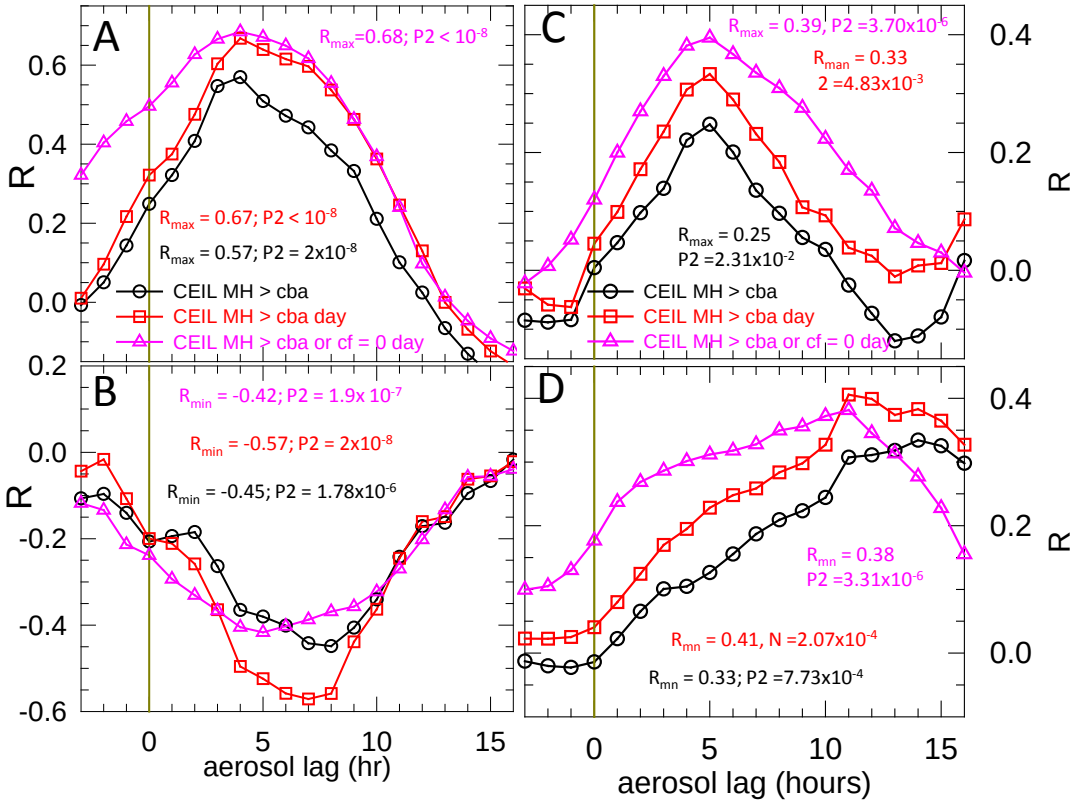

Figure. 1. **A and B Aitken particles 25-100 nm diameter. C and D accumulation particles 100-400 nm.** All data are when mixing height (MH) exceeds cloud base altitude. A legend applies to B. C legend applies to D. Correlation coefficients, R, of ceilometer (CEIL) cloud fraction, cf, (**A**) and (**B**) with mean particle diameter, mpd, and (**C**) and (**D**) cf with concentration for aerosol lags of cf measurements at zero hour. R_{max} is maximum R, R_{min} is minimum R, P2 is two-tailed probability. Black is all CEIL data, red is CEIL daytime (07-19h). Red is daytime cases. Pink includes cf = 0 for daytime.

Cloud fraction (cf) effects on the Aitken and accumulation modes at SGP by Hudson and Noble DRI

Both Aitken (25-100 nm) and accumulation mode (100-400 nm) mean particle diameter (mpd) are positively related to cloud fraction (cf) for surface aerosol lagging cf.

Aitken concentration is negatively related to cf while accumulation concentration is positively related to cf.

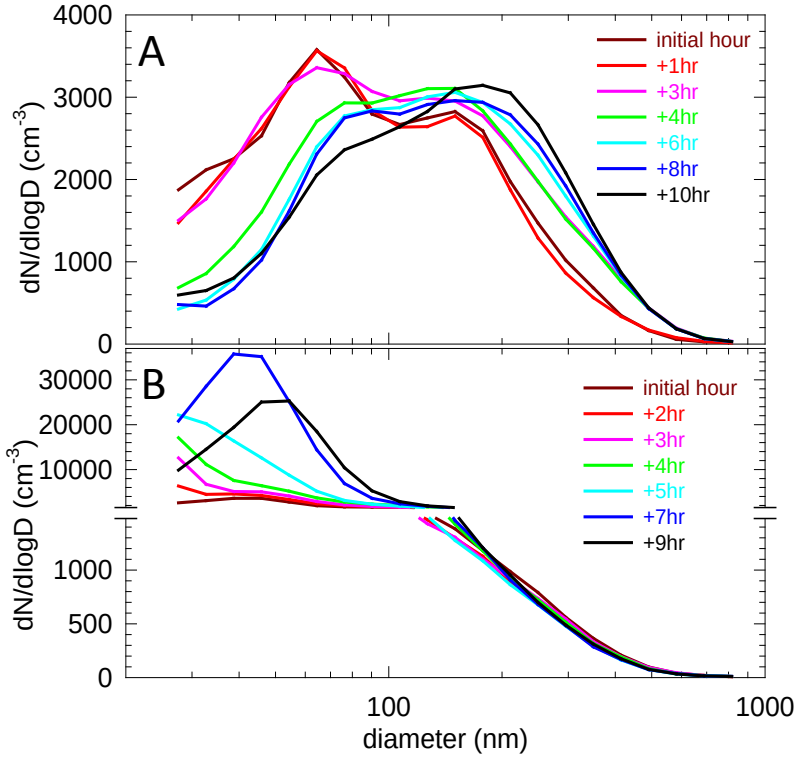

Figure 2. Mean particle size distributions at the initial onset of 7+ consecutive hours of **A**) ceilometer cf > 0.75 when MH > cba and the majority of hours are daytime; and **B**) daytime ceilometer cf = 0.. Hours following onset are denoted in legend.

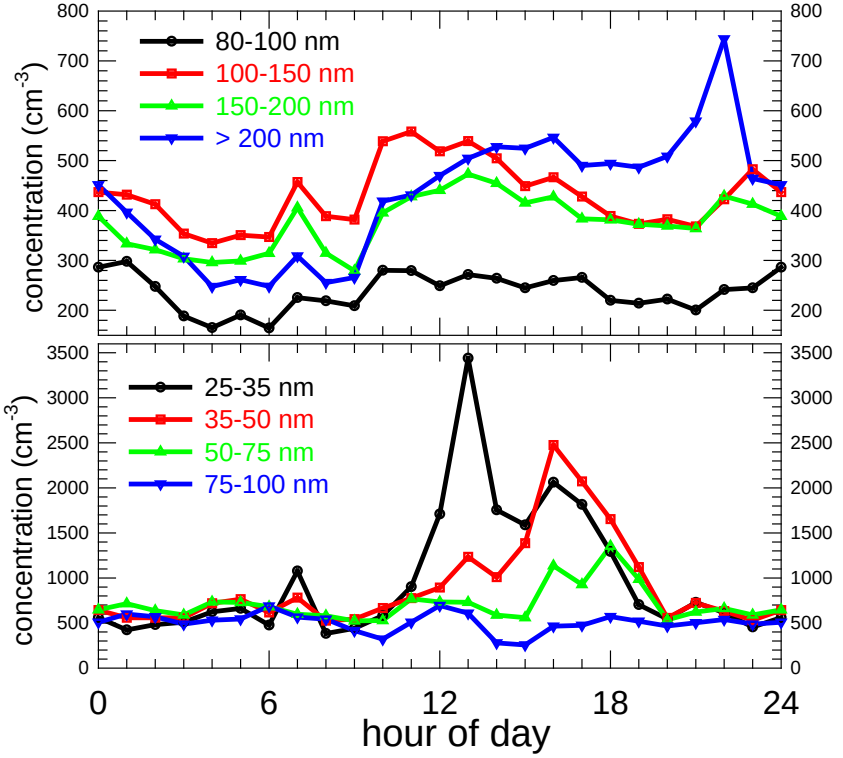

Figure 3 (**A**) Diurnals of large particle concentrations (mostly accumulation) when CEIL cf 5-hour running mean 4 hours prior to aerosol exceeds mean cf, 0.225. (**B**) Diurnals of small particle concentrations, Aitken, when CEIL cf = 0.

Cloud processing of aerosol occurs in continental air and can be readily detected at the surface.

Photochemical particle production is readily observed in non-cloudy conditions.

Aitken particles nucleate cloud droplets even when there are abundant accumulation particles.

Cloud processing is the best way to move Aitkens to accumulation.