

Two CCN spectrometers as in ICE-L, RICO, PASE, etc.
to cover the entire S range, need to extend range
in both directions; high S ($>1\%$) and
low S (large nuclei; GN)
to check each other in overlap S range
to provide redundancy
one can monitor ambient while the other
measures processed aerosol
volatility
size versus S_c
CVI?
interstitial?

ICE-T will be RICO2

RICO had great variability, factor of 4 in CCN
and cloud droplet concentrations

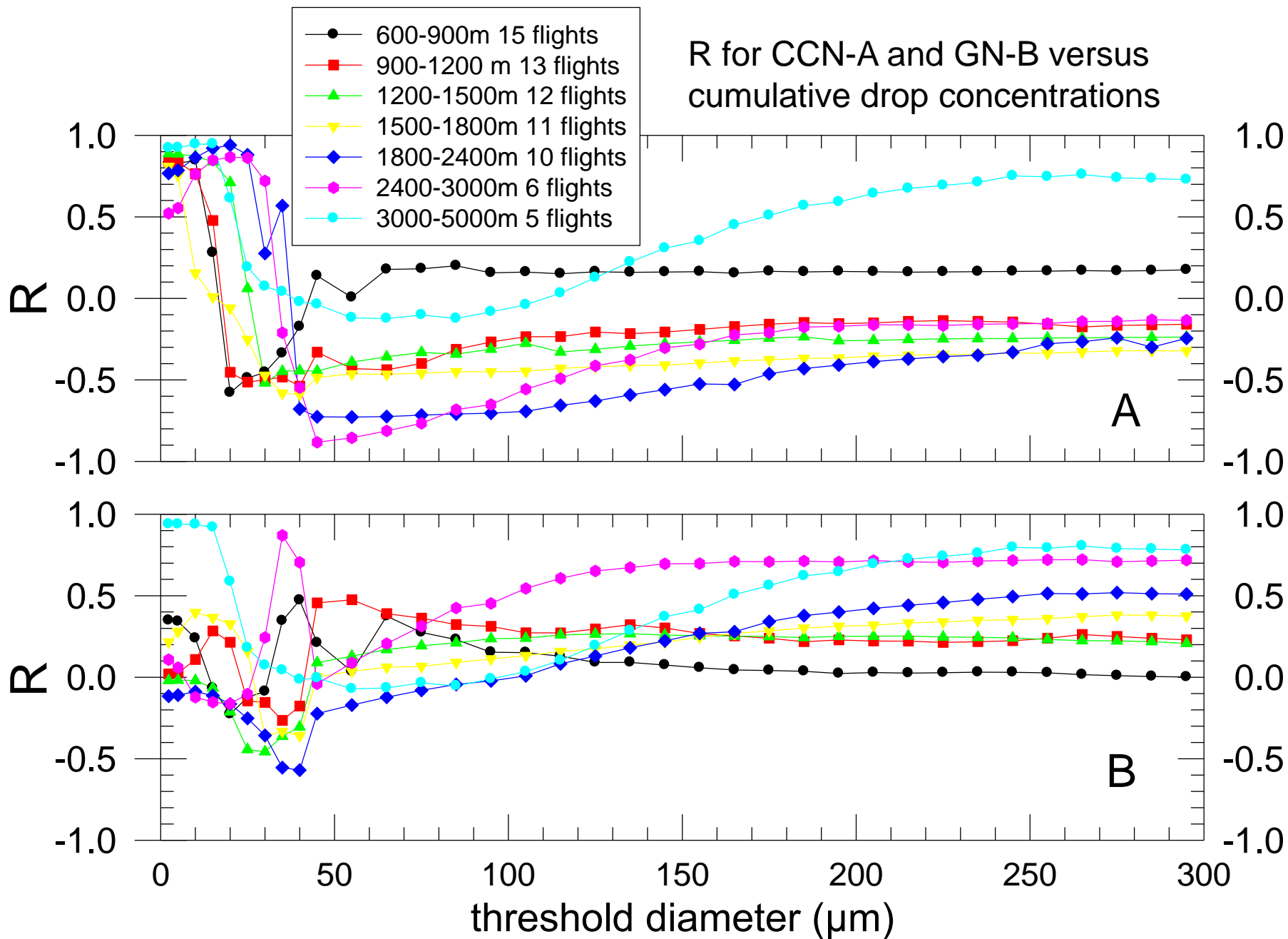
Drew my interest in Giant Nuclei; paper published in GRL
last week

More higher altitude cloud measurements in ICE-T,
limited in RICO—only 5 flights with cloud
above 3 km

Sea salt (NaCl) as CCN??

CCN volatility, Twomey 1971, Hudson and Da 1996

Cloud supersaturations higher than conventional wisdom,
GRL paper published late last year—means
that smaller particles make cloud droplets,
especially in cleaner air



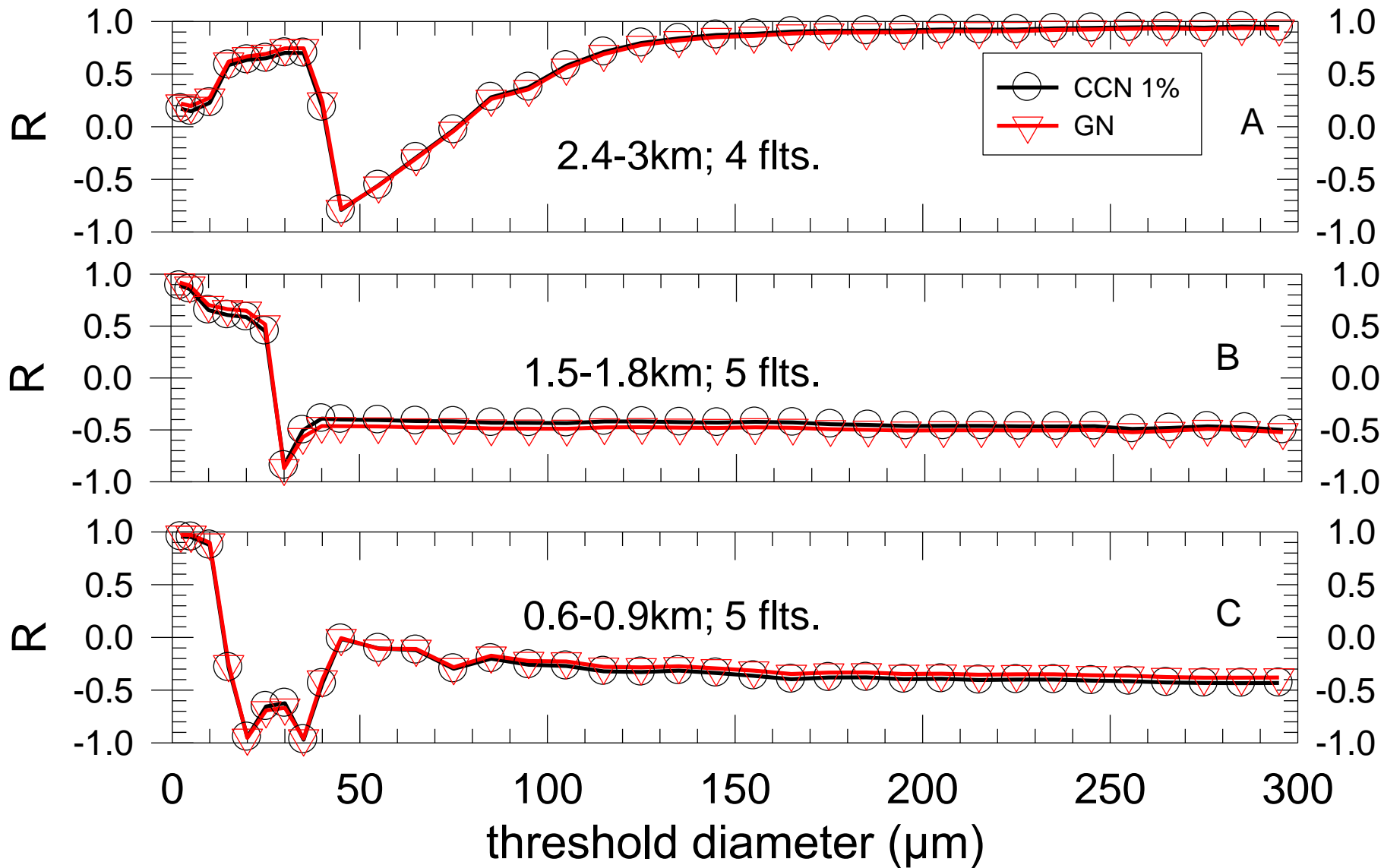
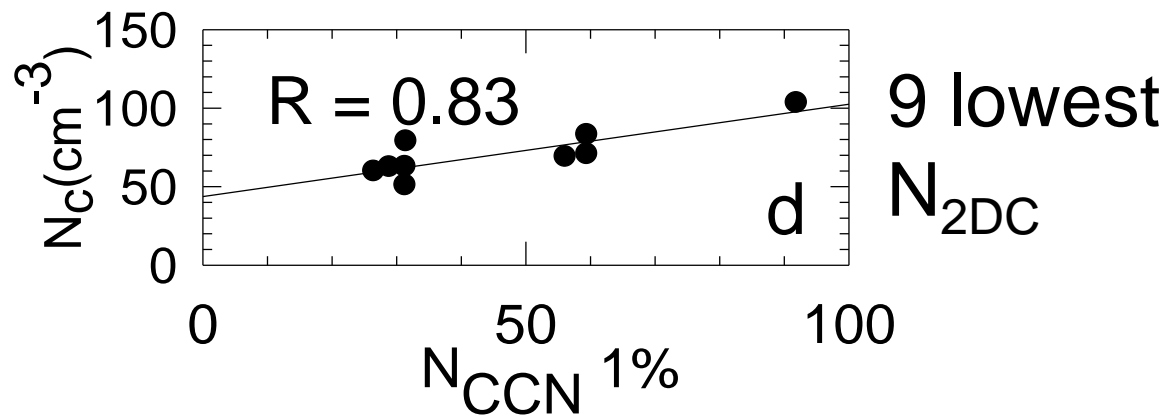
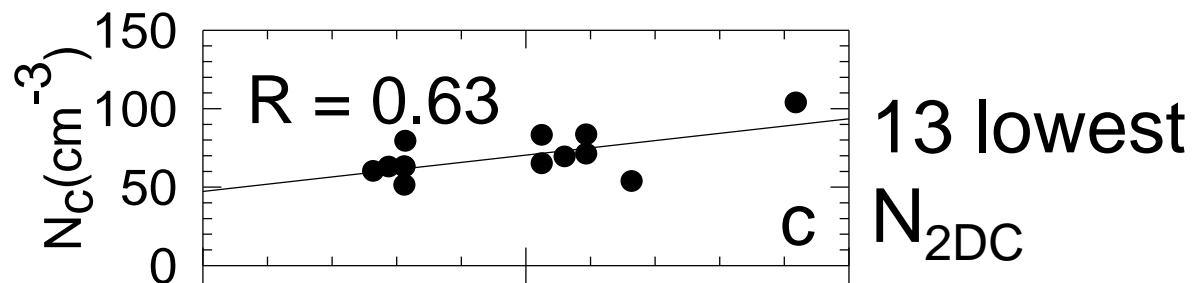
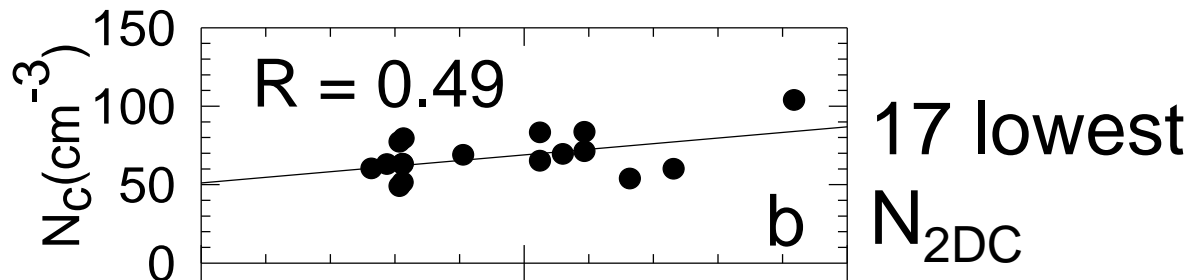
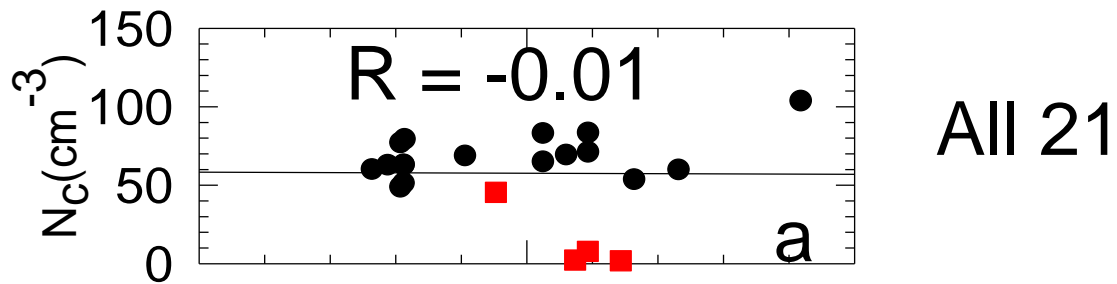
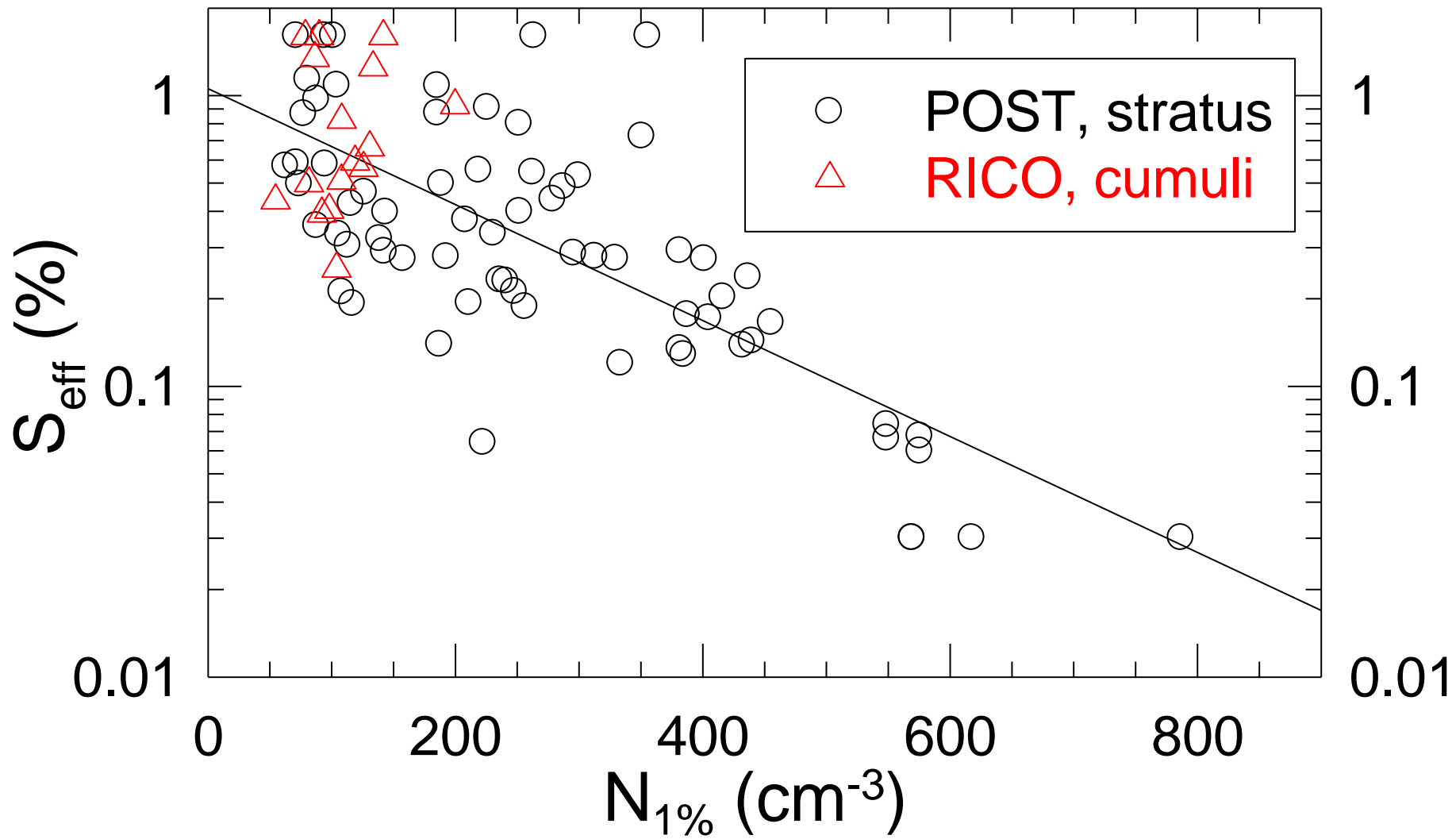
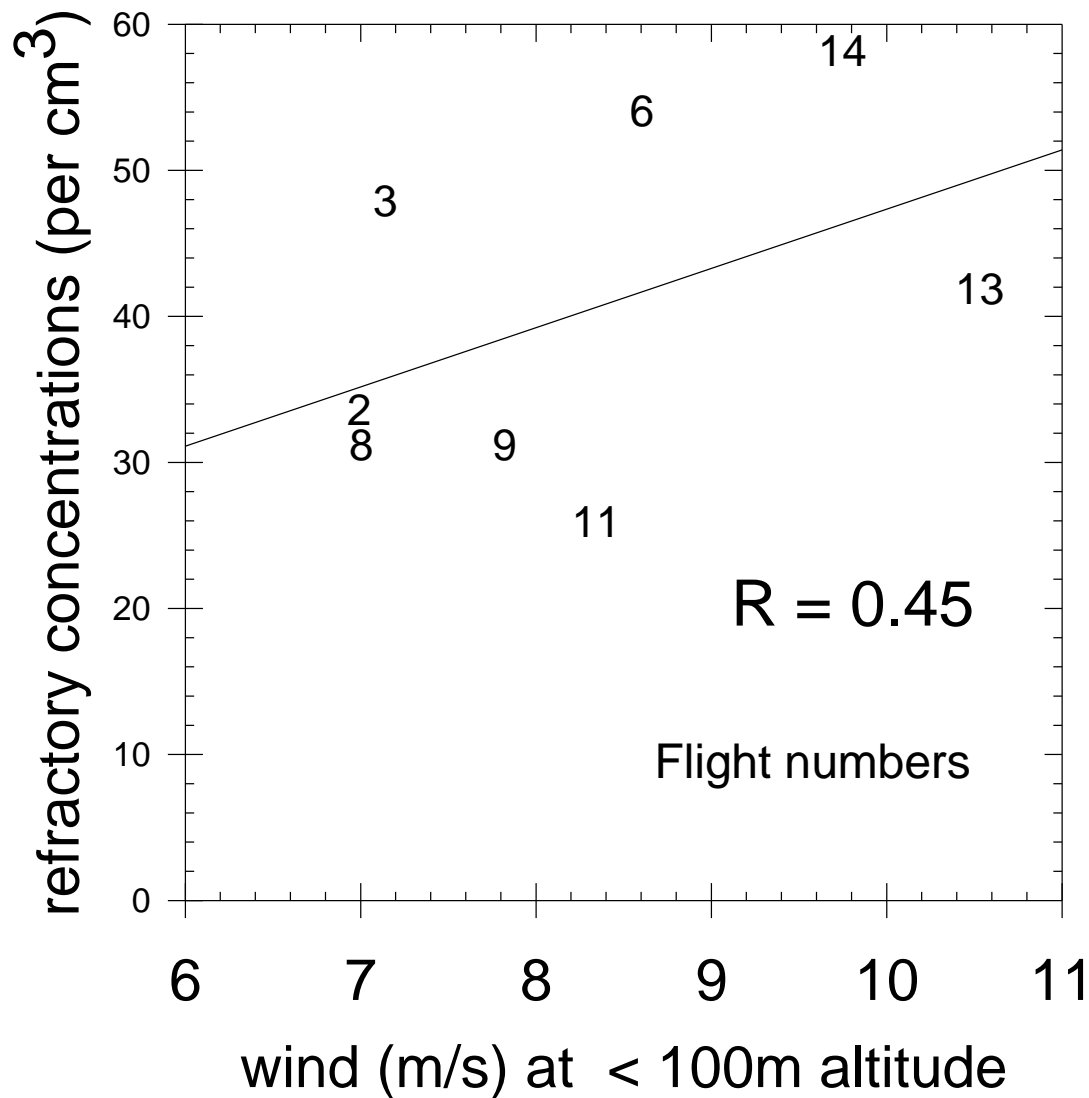


Figure 11. As Fig. 10 but only for flights in these altitude bands with high R for $N_{\text{GN}} - N_{1\%}$. For 2.4-3 km R for $N_{\text{GN}} - N_d >$ all 6 flights, for 1.5-1.8 km $R <$ all 11 flights, for 600-900m $R <$ for all 15 flights.

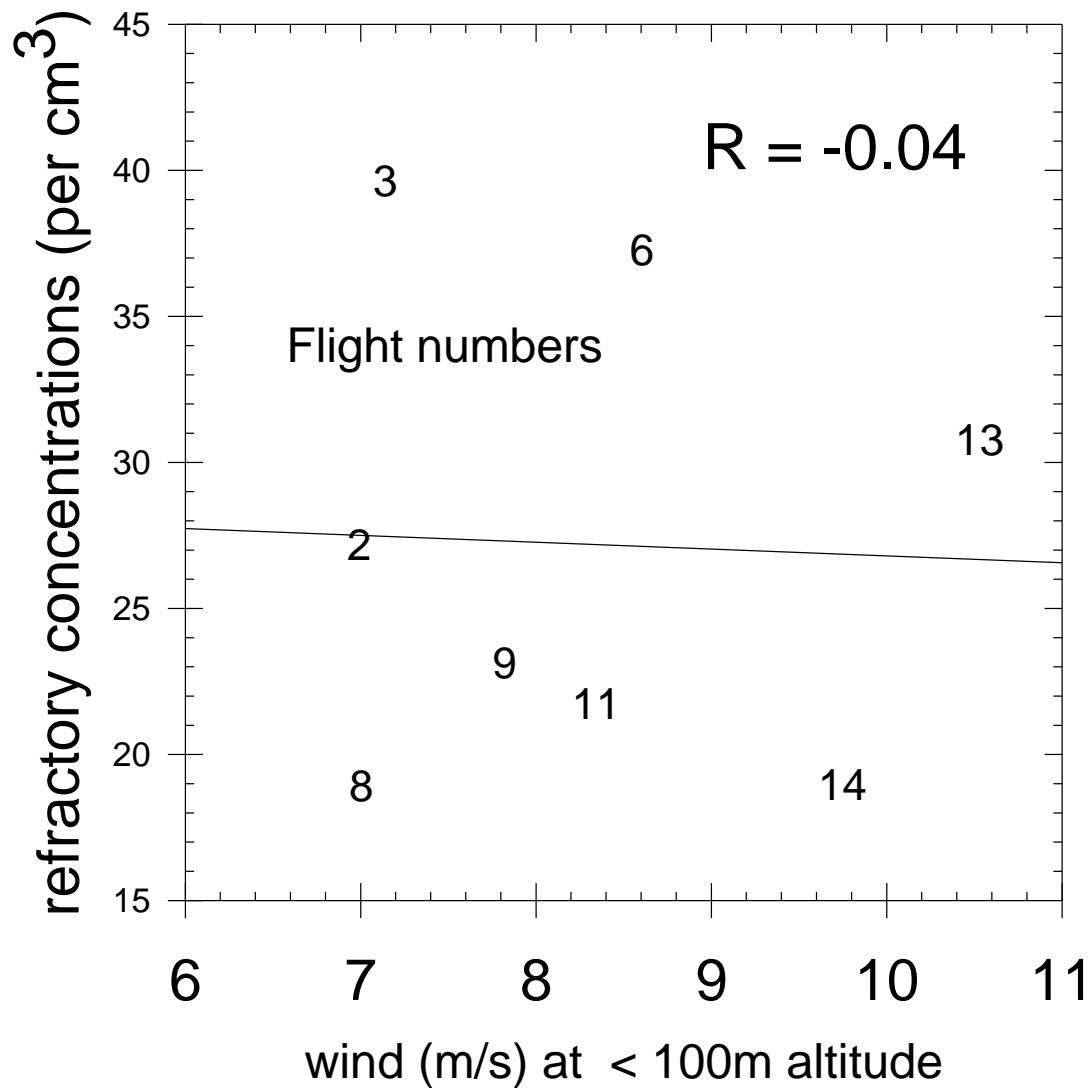




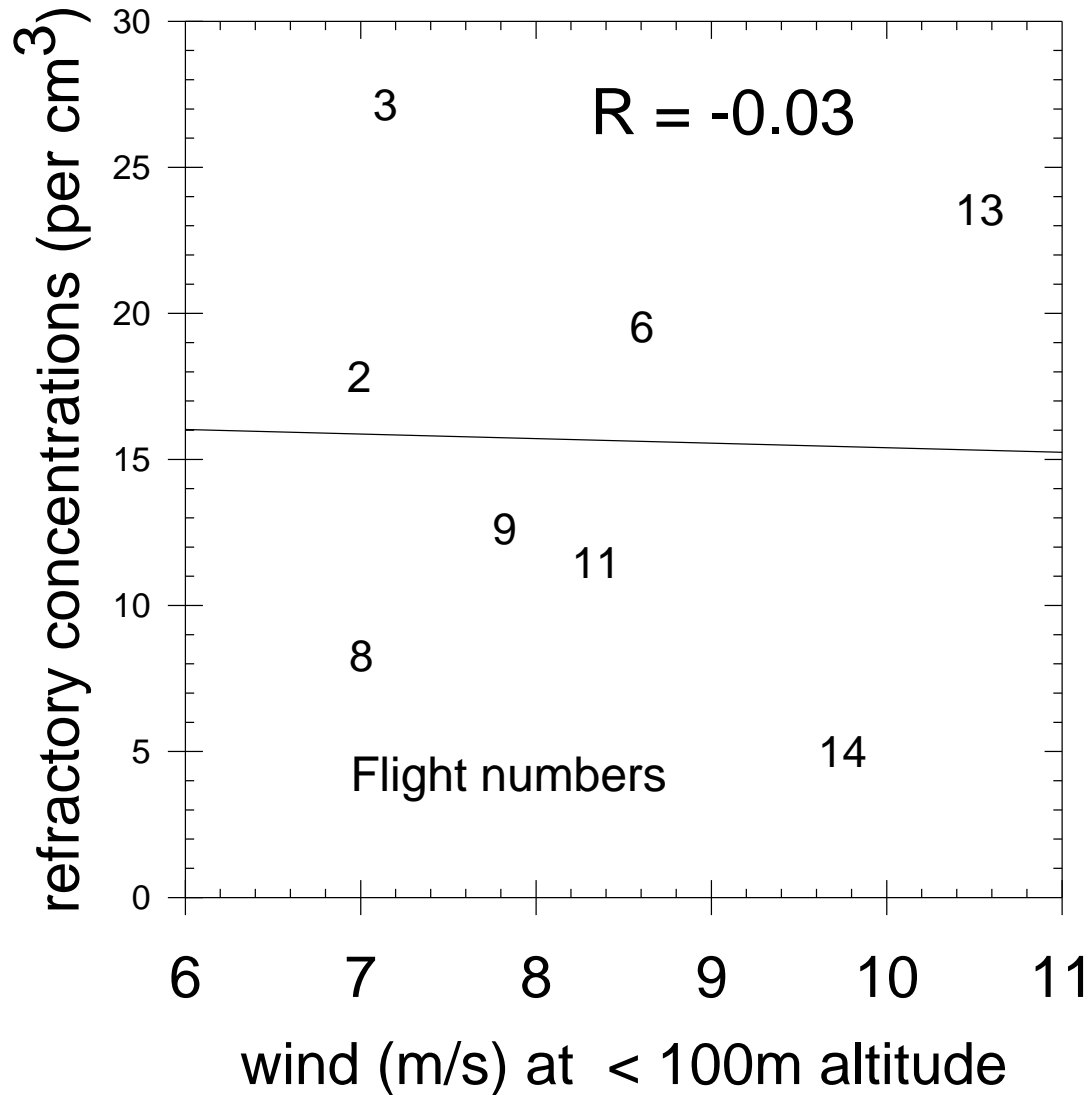
PASE volatility refractory CCN 1% at 300C versus wind velocity



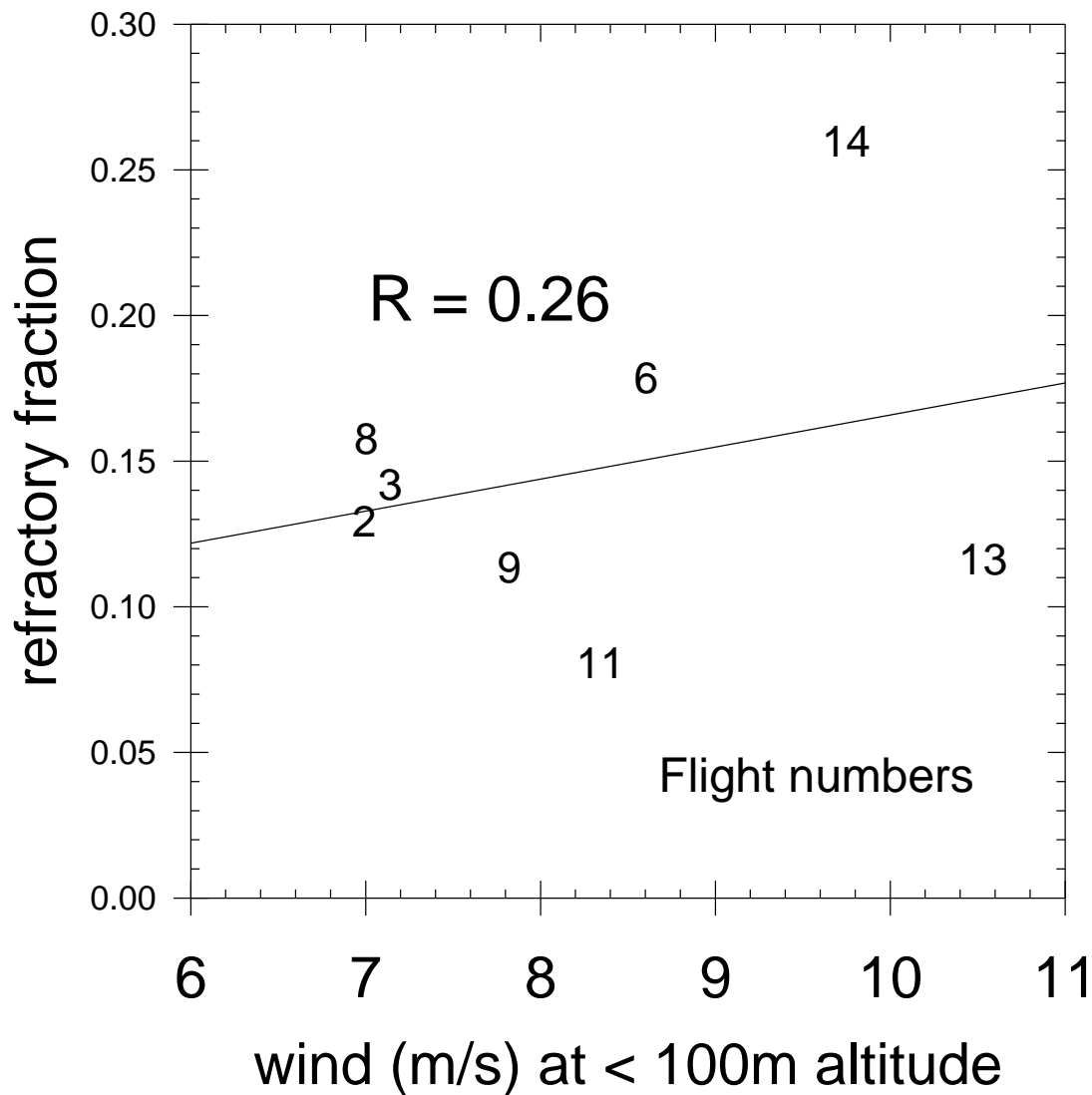
PASE volatility refractory CCN 0.3% at 300C versus wind velocity



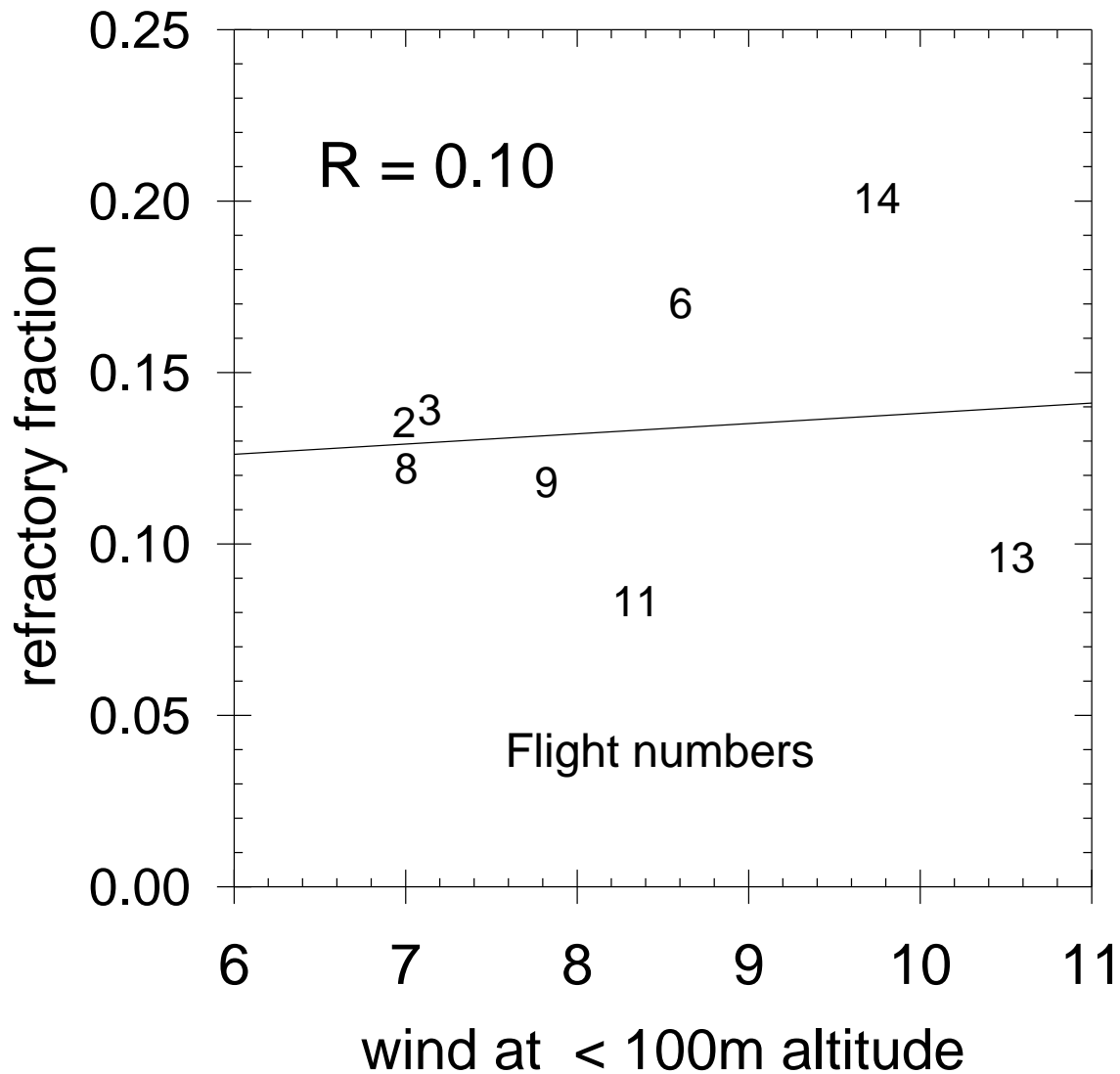
PASE volatility refractory CCN 0.1% at 300C versus wind velocity



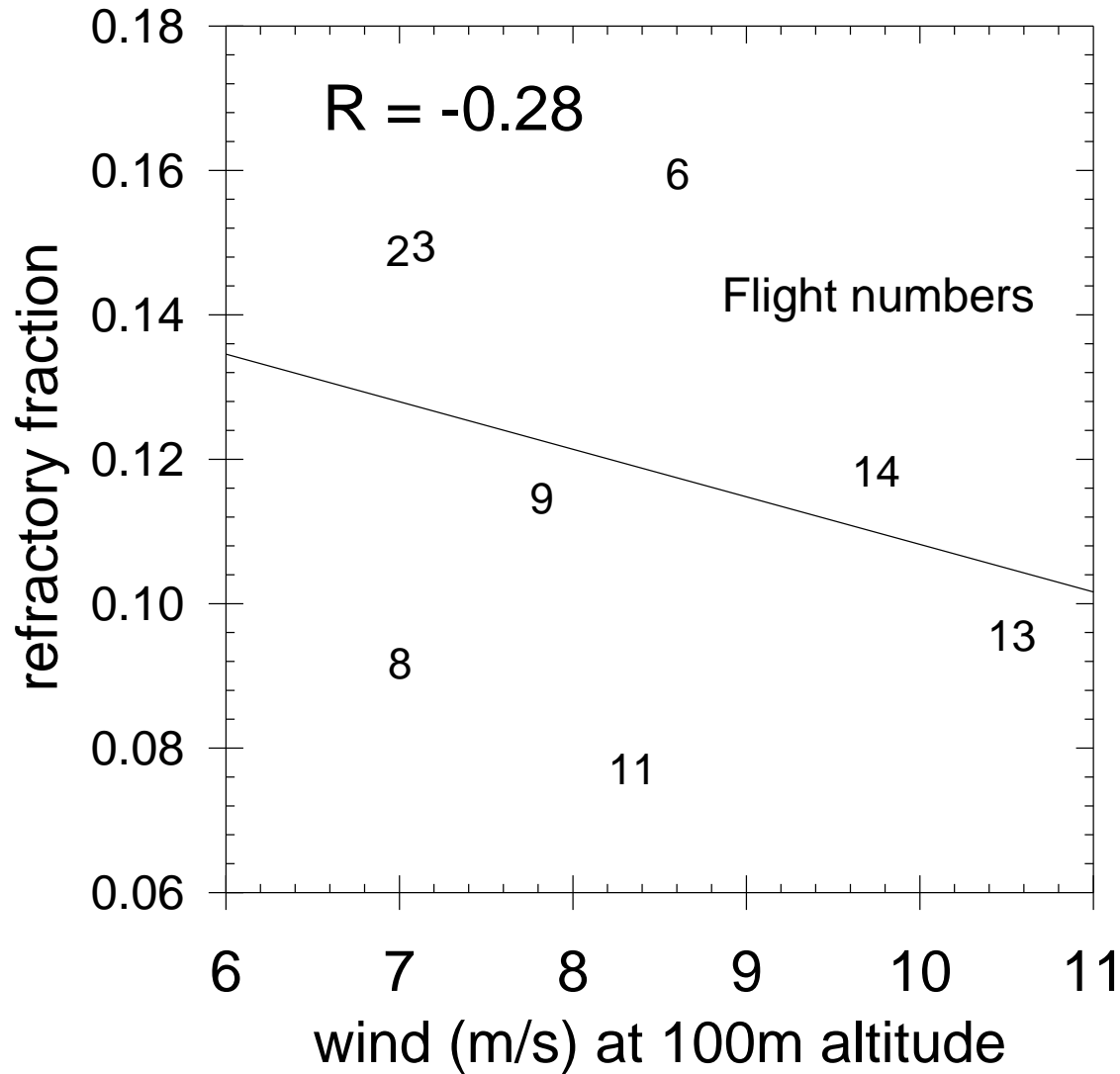
PASE volatility refractory CCN 1% at 300C versus wind velocity



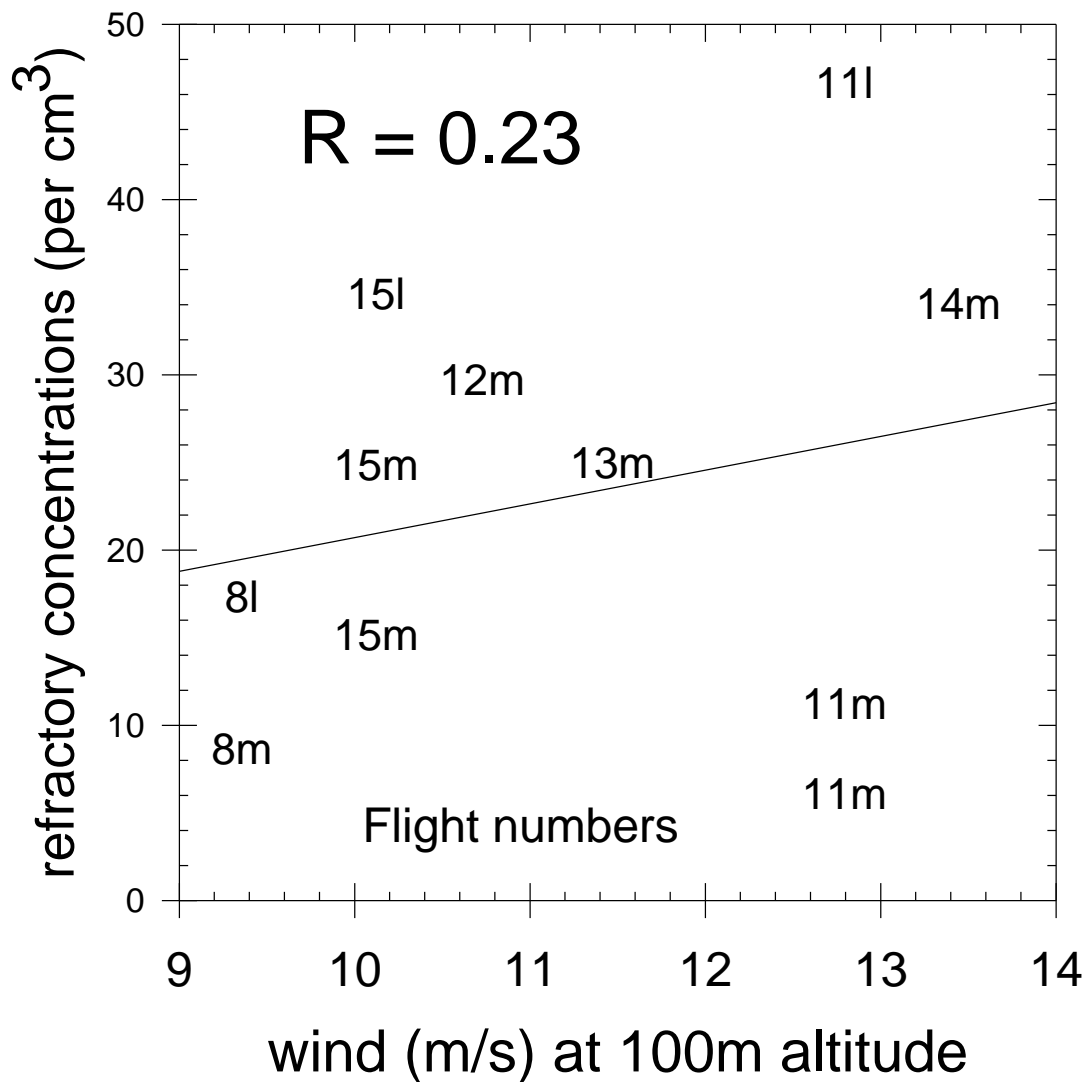
**PASE volatility
refractory CCN 0.3% at 300C
versus wind velocity**



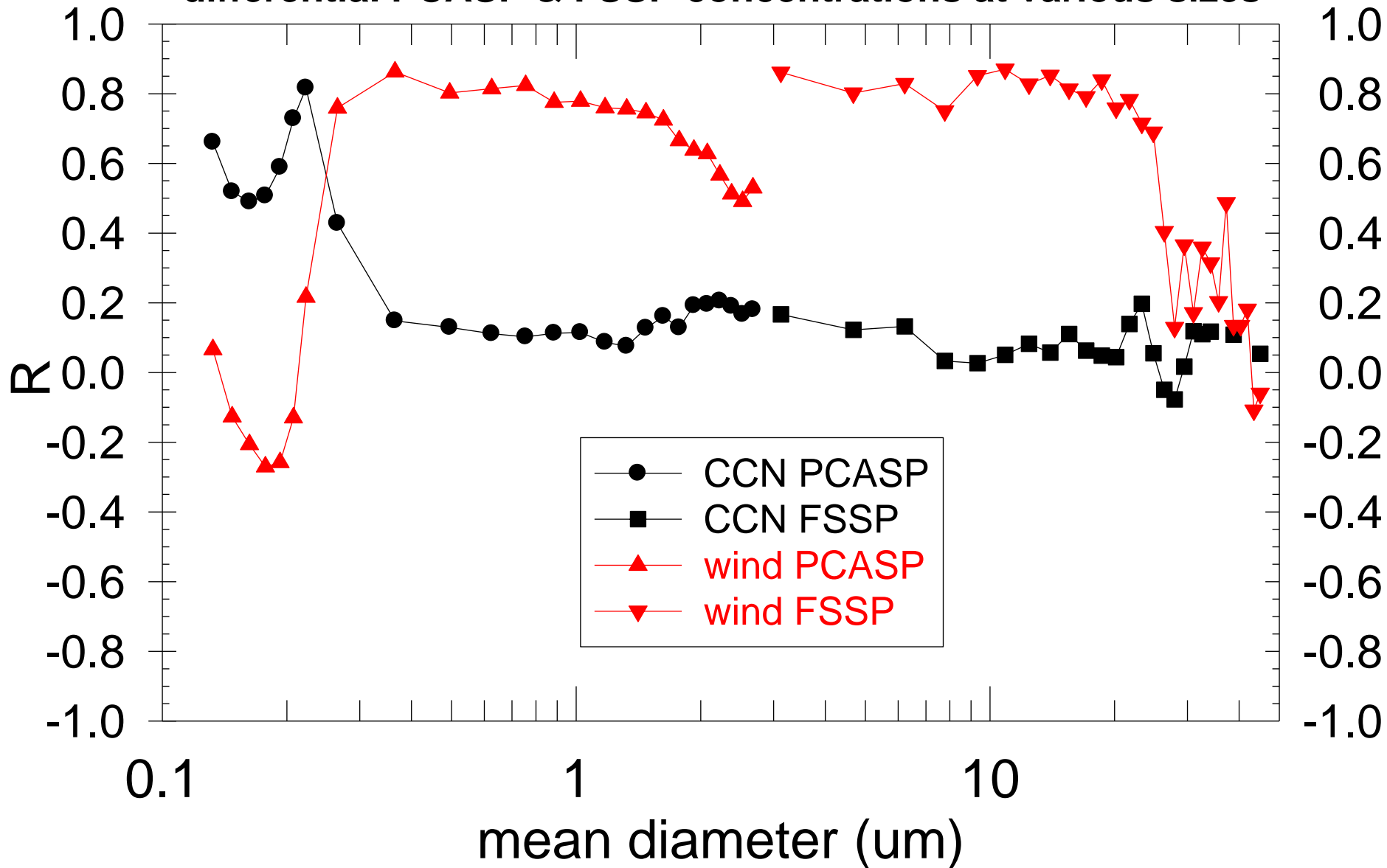
RICO volatility refractory fraction of total CCN at 300C versus wind velocity



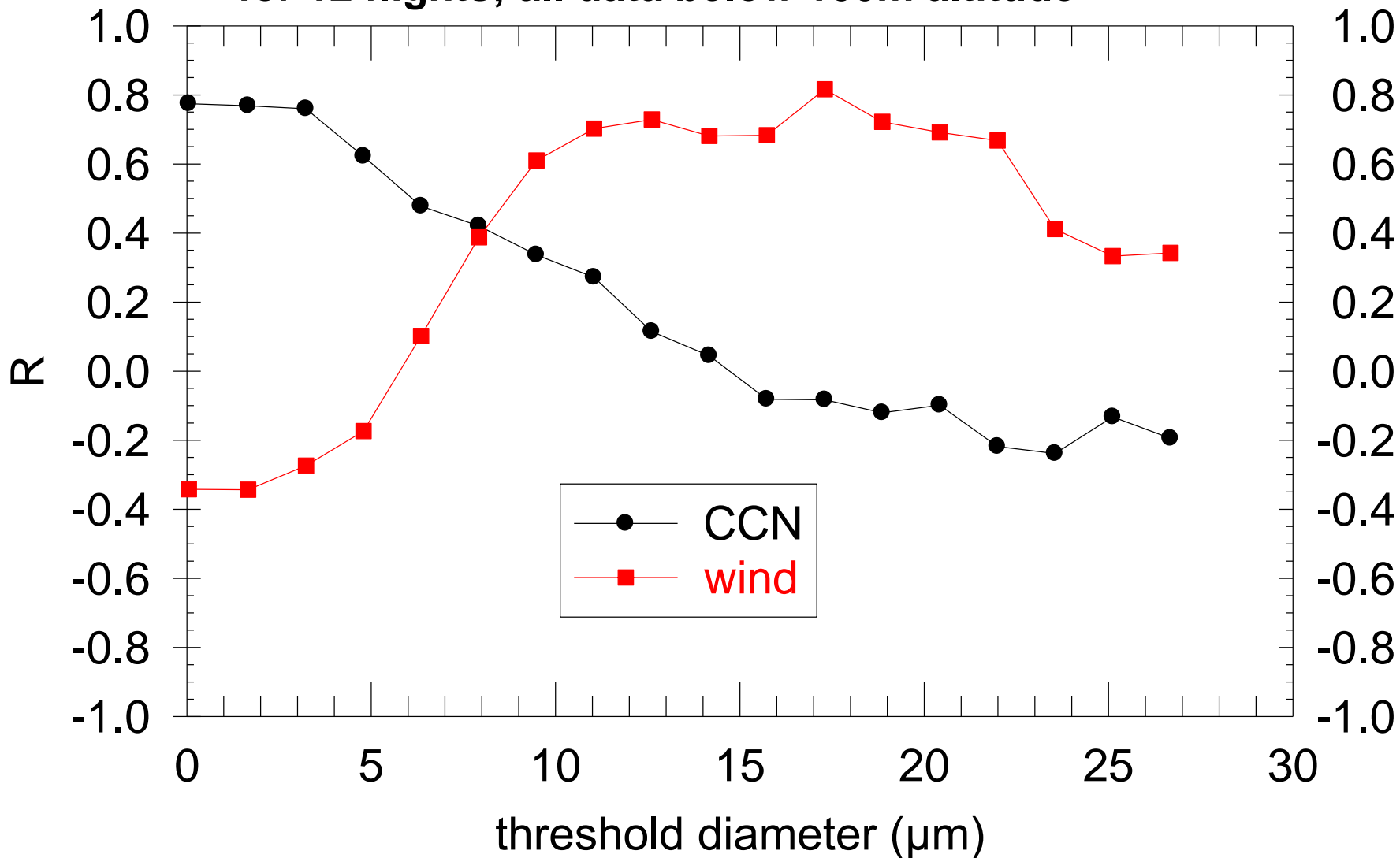
RICO volatility refractory total CCN concentration at 300C versus wind velocity



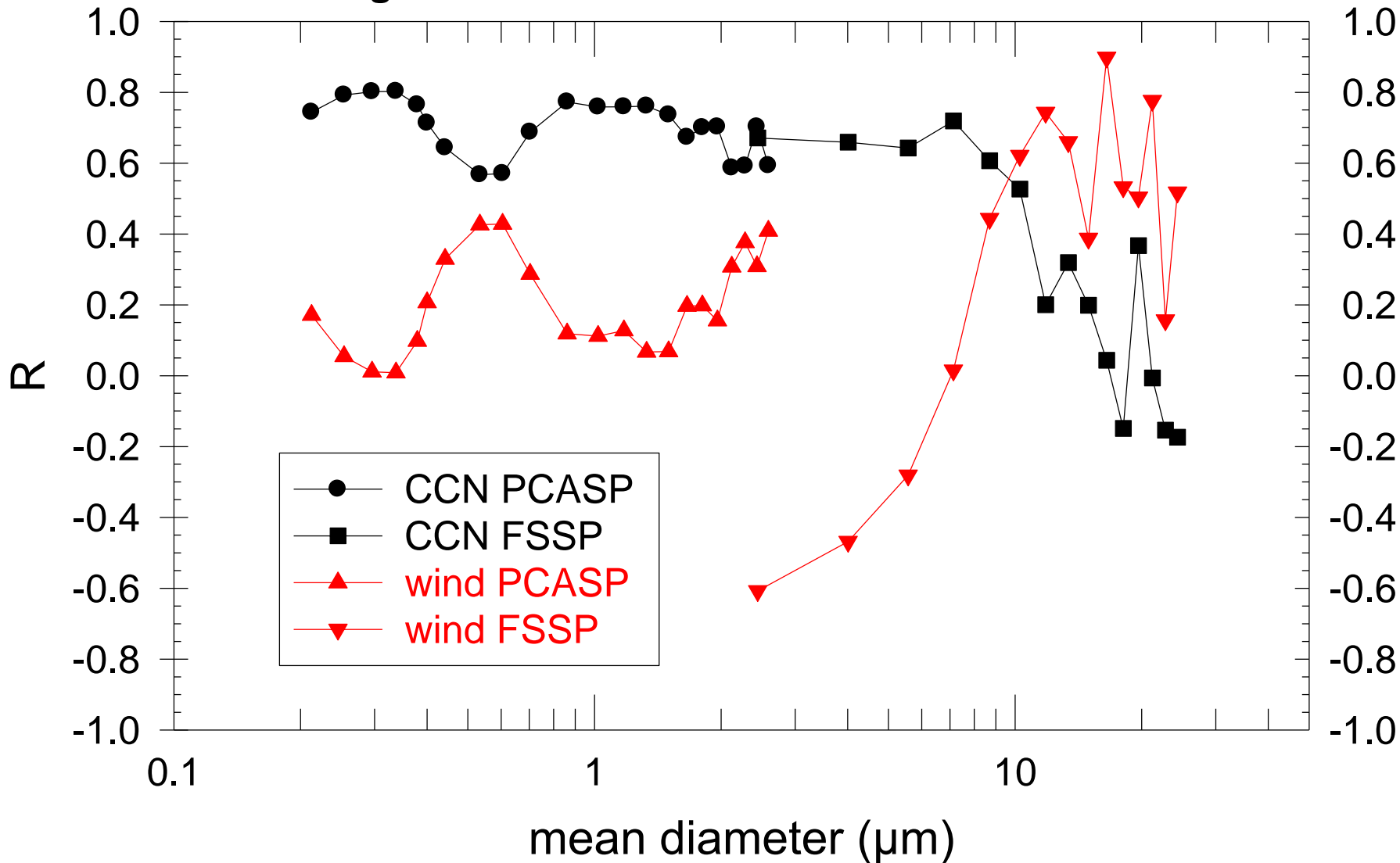
RICO 14 flights; 26 data points, correlation coefficients (R) for CCN 1% and wind velocity at 100m altitude versus differential PCASP & FSSP concentrations at various sizes



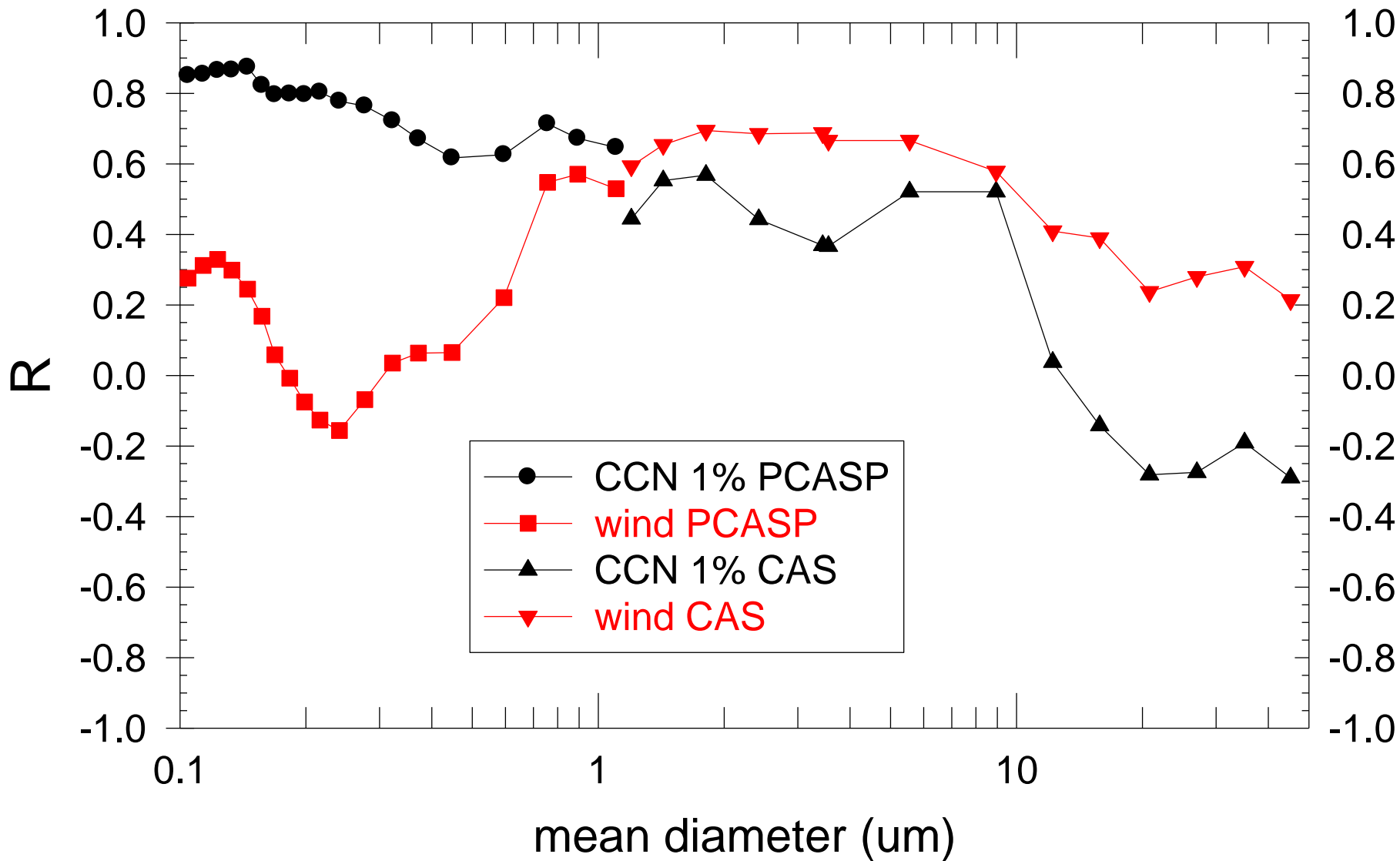
PASE; correlation coefficients (R) for cumulative FSSP conc. versus horizontal wind and CCN concentration at 1% for various threshold sizes for 12 flights; all data below 100m altitude



PASE; correlation coefficients (R) for differential FSSP and PCASP conc. versus CCN for various mean sizes for 8 flights that had PCASP all data <100m altitude



POST 68 data points, correlation coefficients (R) for CCN 1% and wind with differential PCASP & CAS concentrations



0.3 micrometers diameter ~0.03%;
Large Nuclei; Giant Nuclei (GN)
related to CCN; to GN,
wind sea surface origin