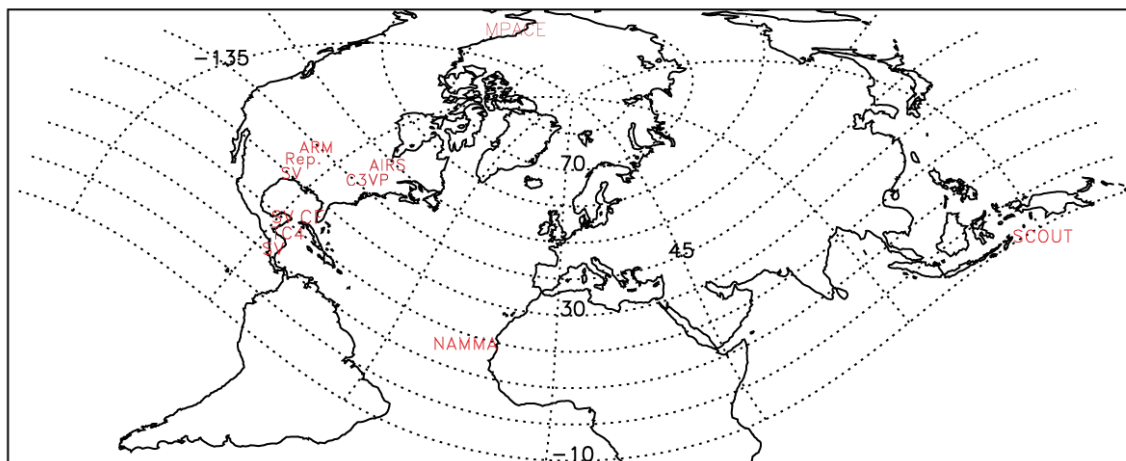
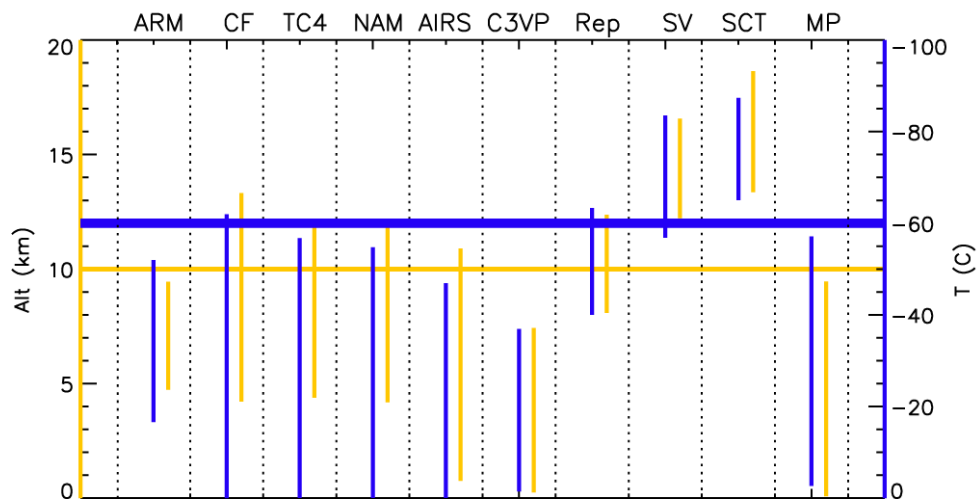


Ice Cloud Particle Parameterizations
for Temperatures of 0 to -90C
for CMMAP

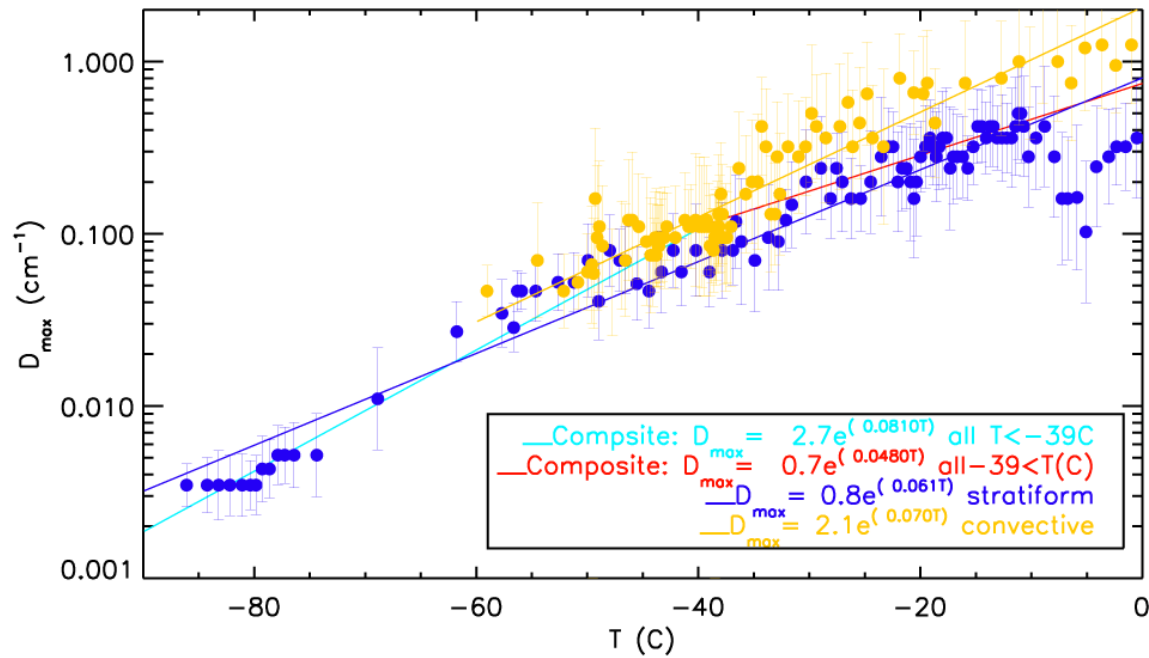
FIELD CAMPAIGNS



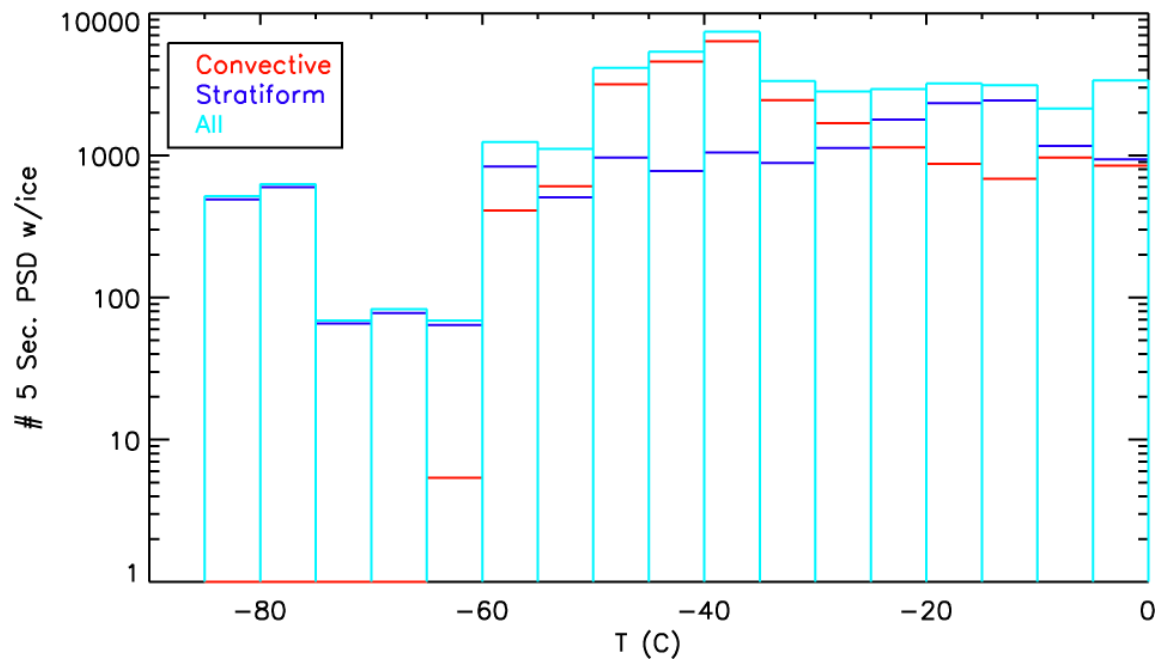
- ARM: ARM 2000, Atmospheric Radiation Measurement (ARM) Field Campaign, 2000
- CF: CRYSTAL-FACE, The Cirrus Regional Study of Tropical Anvils and Cirrus Layers – Florida Area Cirrus Experiment, 2002
- TC4: The Tropical Composition, Cloud and Climate Coupling (TC4) Field Campaign, 2007
- NAM: NAMMA – The NASA African Monsoon Multidisciplinary Analyses Campaign, 2006
- AIRS: AIRS_2, Alliance Icing Research Study II, 2003–2004
- C3VP: Canadian CloudSat/CALIPSO Validation Program, 2006–2007
- Rep: Replicator Observations, First ISCCP Research Experiment (FIRE)–2, 1991
- SV: Experiments with CF and pre-AURA Validation Experiment, 2002 and 2004
- SCOUT: Stratospheric Climate Links w/Emphasis on the Upper Troposphere/Lower Stratosphere, 2003
- MPACE: Mixed-Phase Arctic Cloud Experiment, 2004



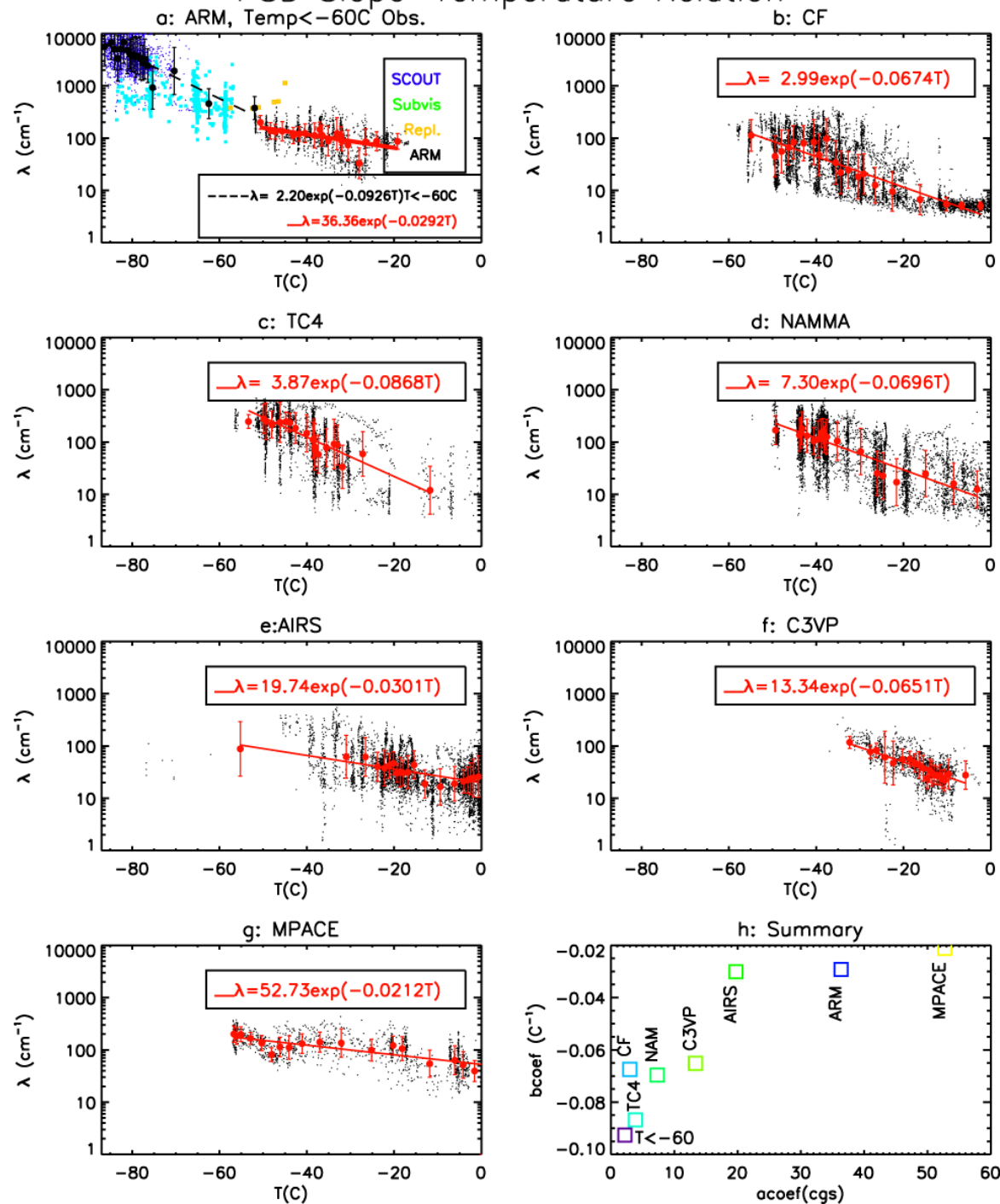
Temperature Dependence of PSD Properties
 a: Max. Diam. $f(T)$



b: Number of ICE PSD

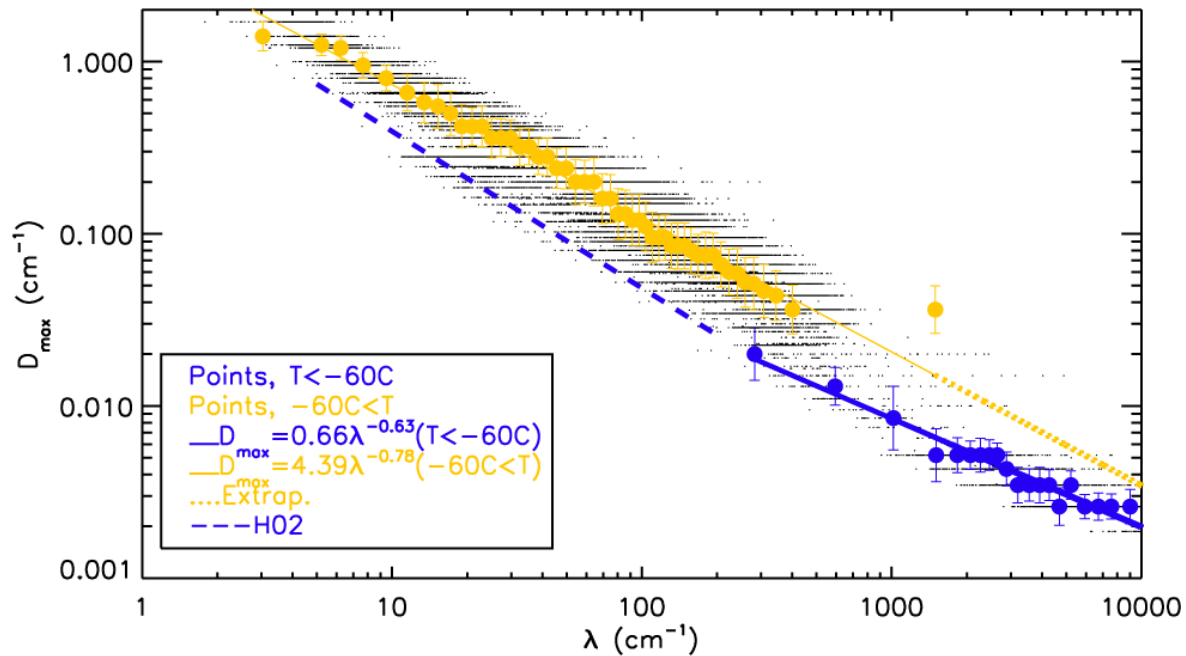


PSD Slope-Temperature Relation

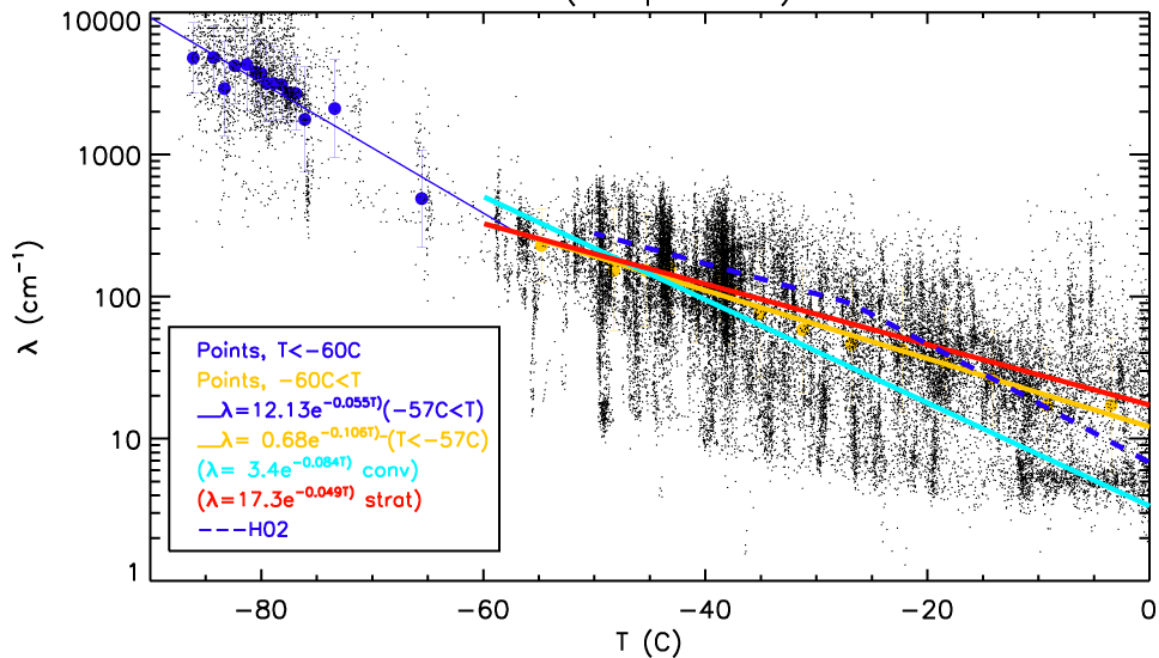


$$N = N_0 D^m e^{-lD}$$

PSD Slope Relationships
a: To Max. Diam.f()

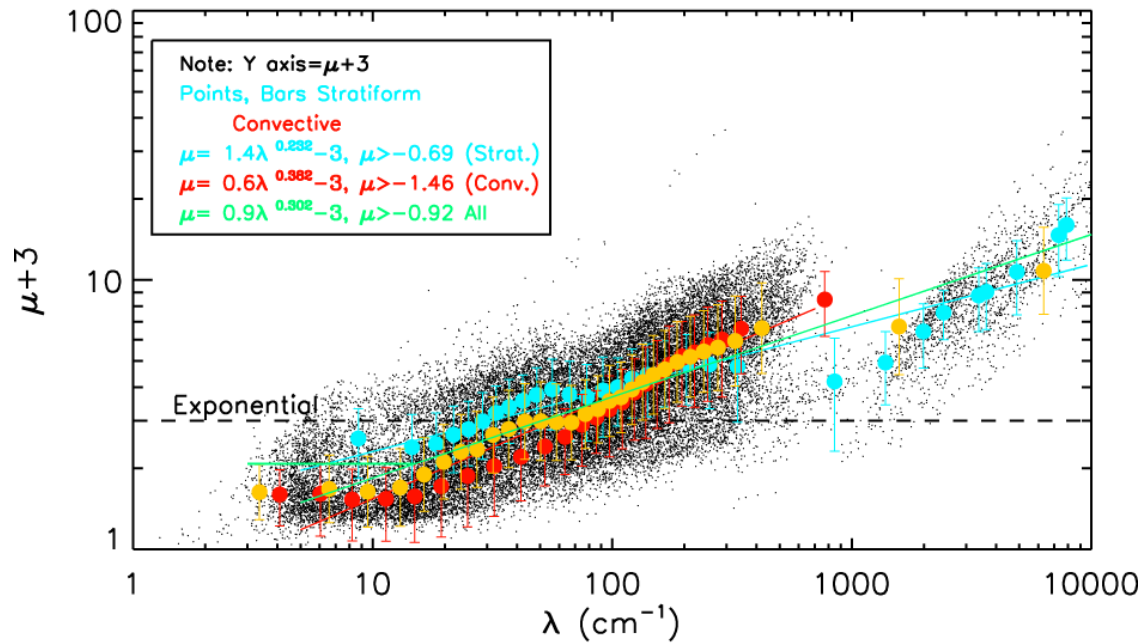


b: f(Temperature)

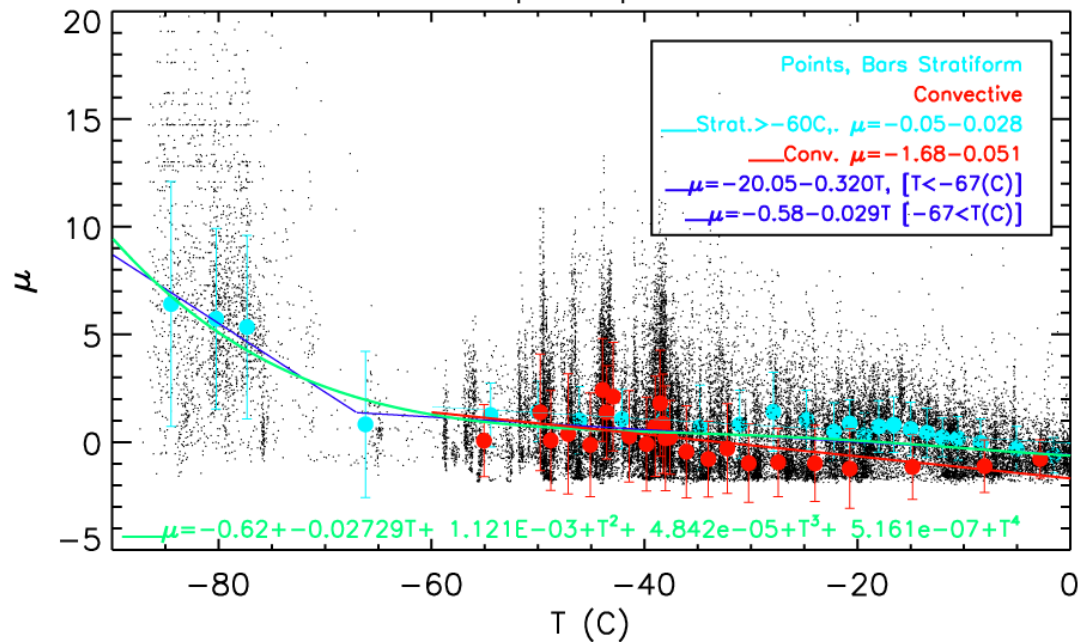


PSD Dispersion

a: λ Dependence

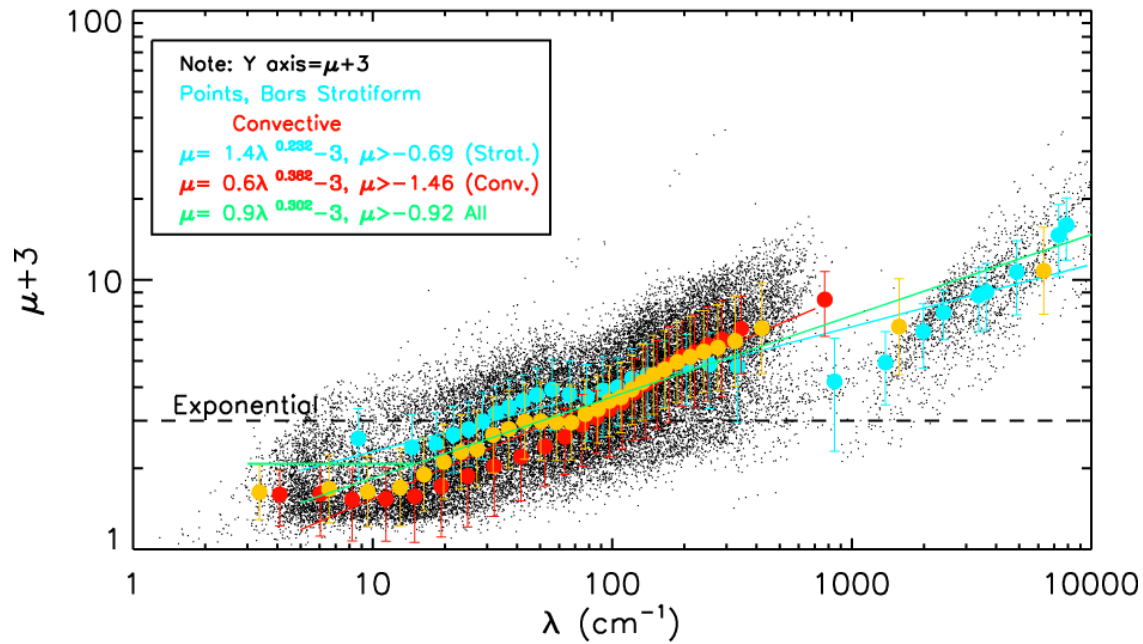


b: Temp. Dependence

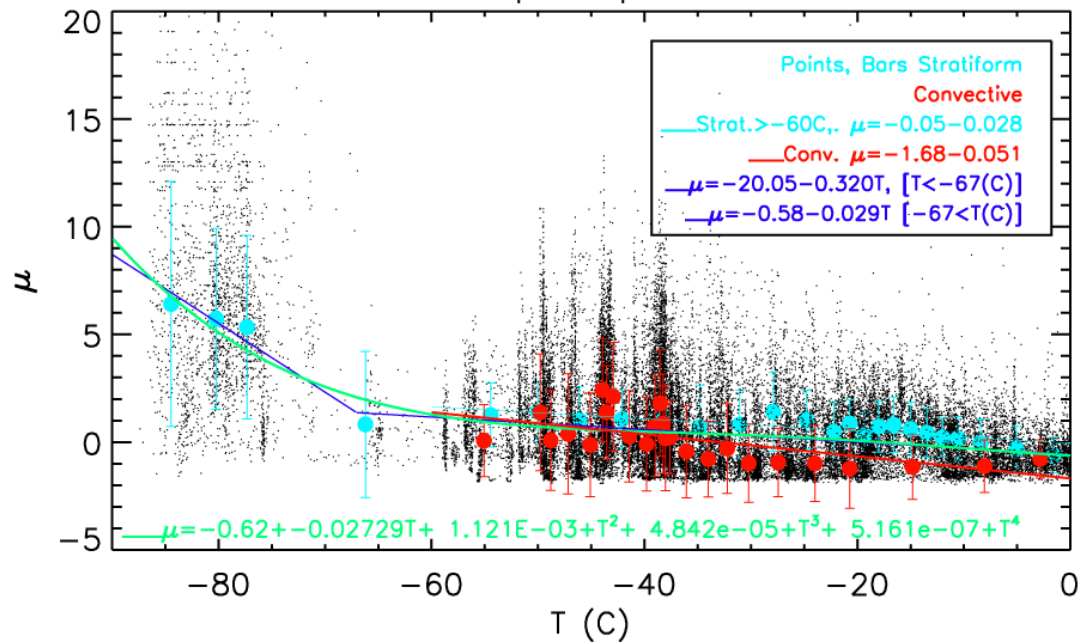


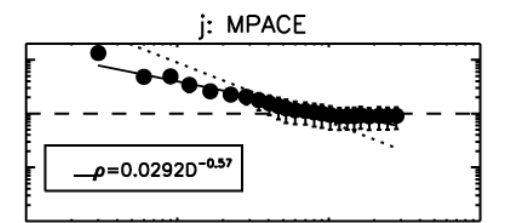
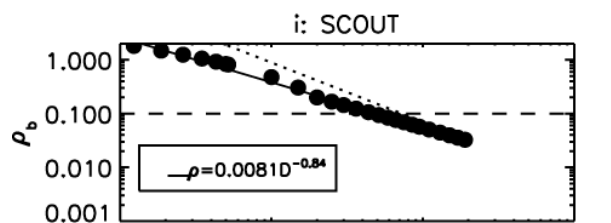
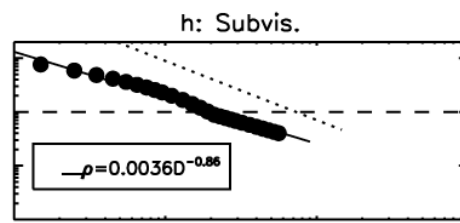
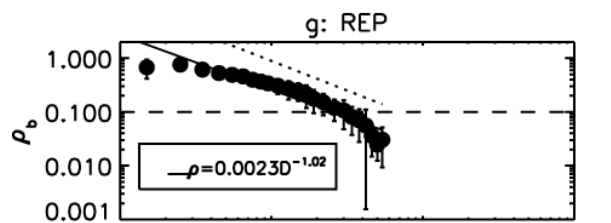
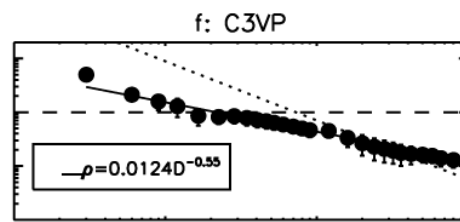
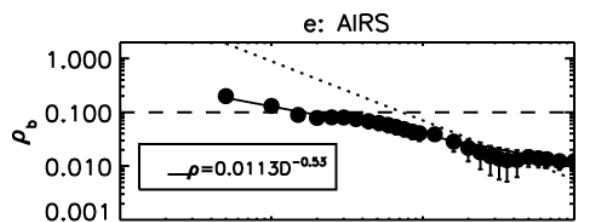
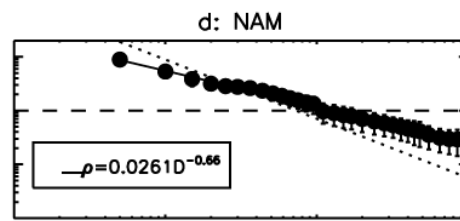
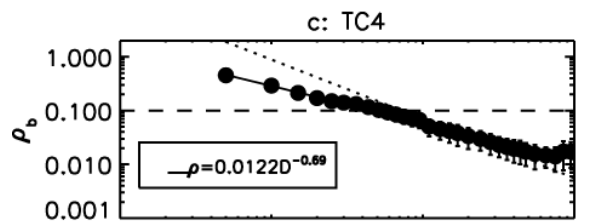
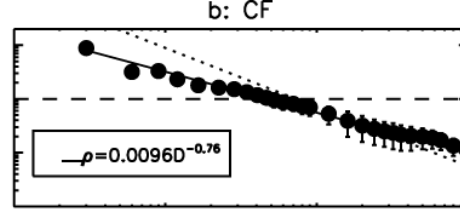
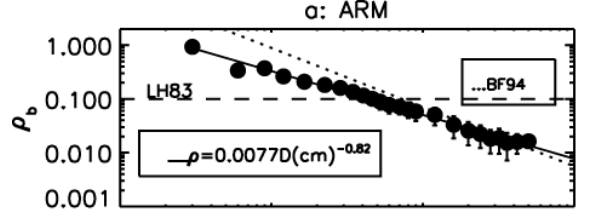
PSD Dispersion

a: λ Dependence



b: Temp. Dependence

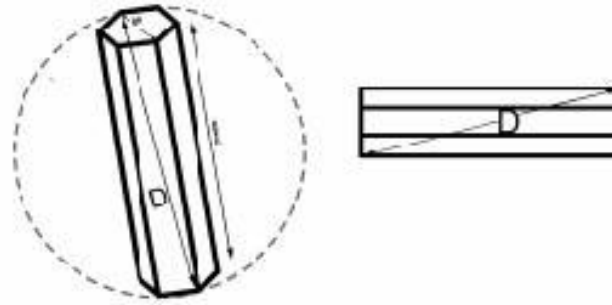




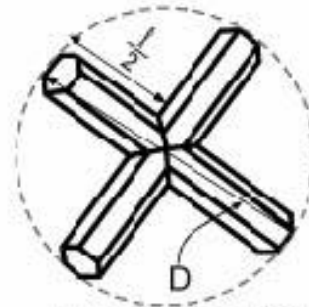
Diam. (μm)

Diam. (μm)

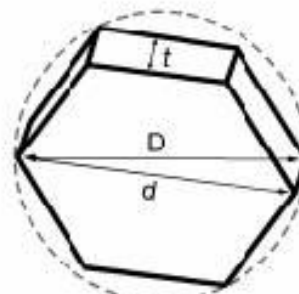
Idealized Crystal Geometries



Hexagonal column

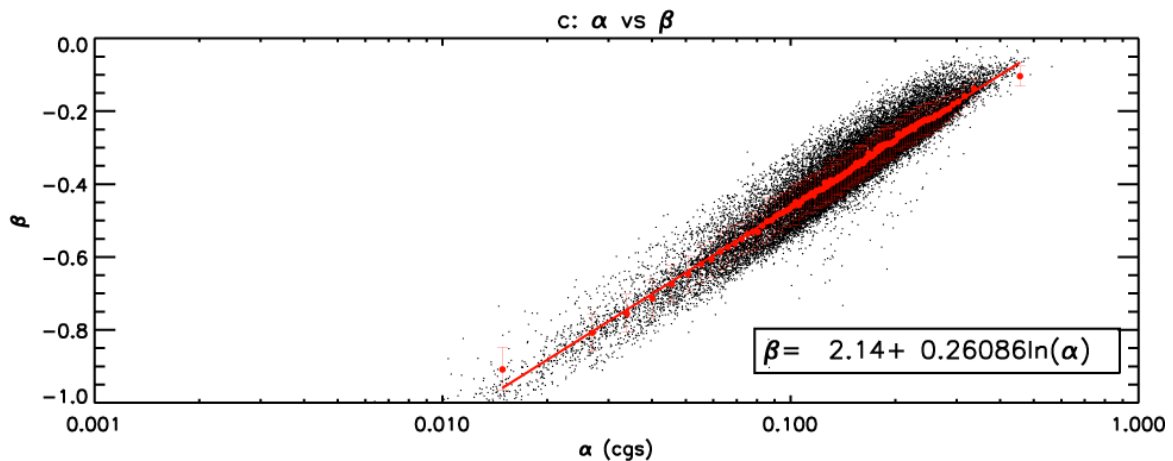
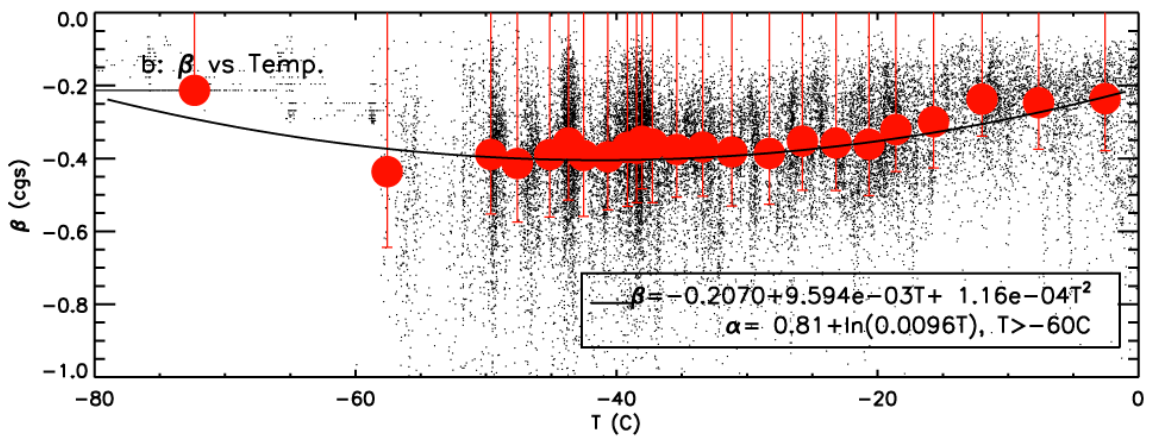
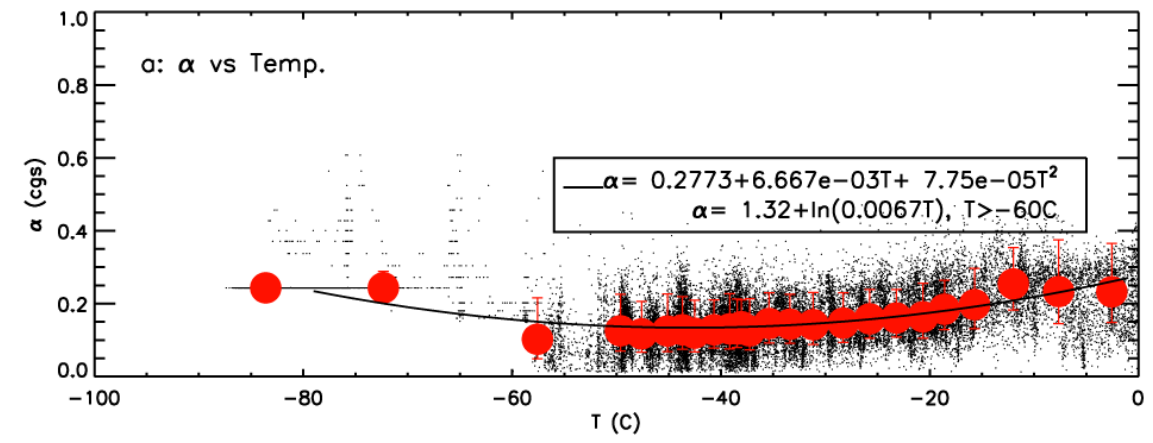


Bullet rosette

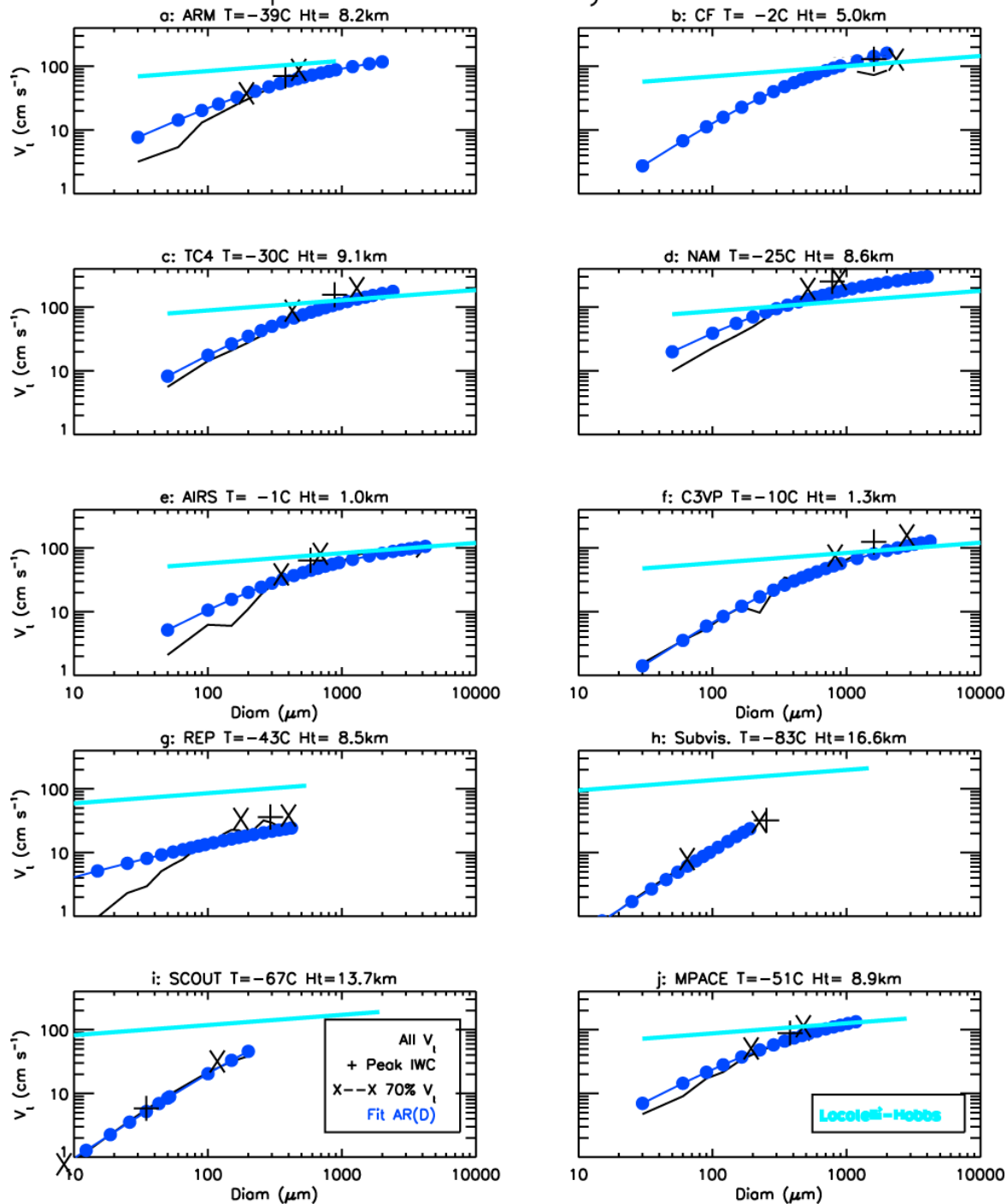


Plate

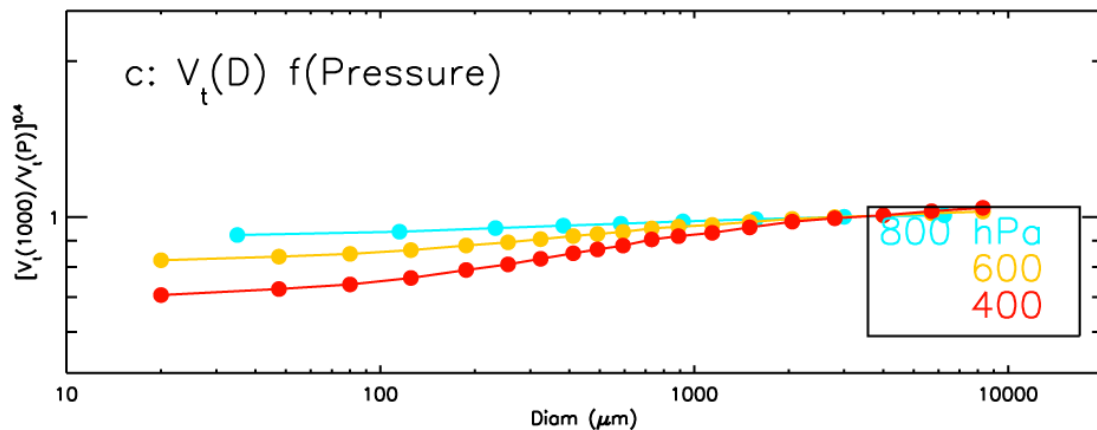
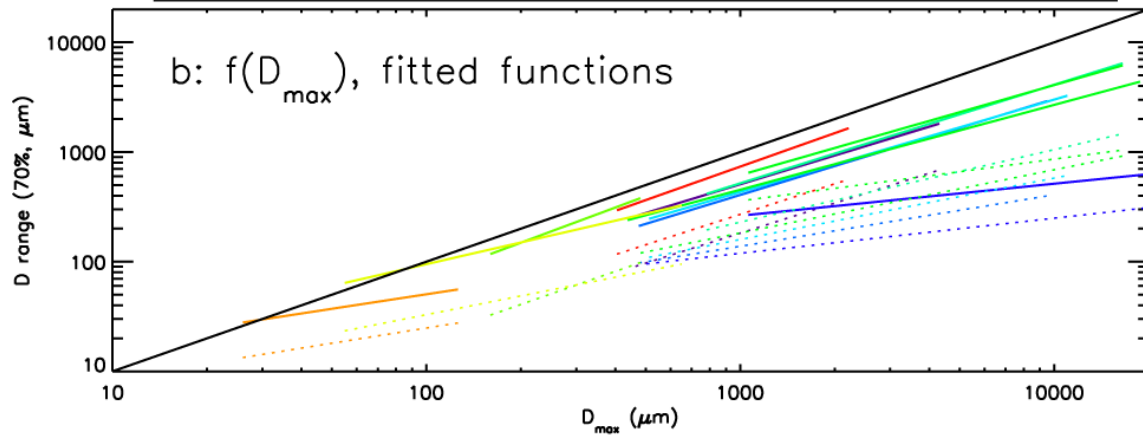
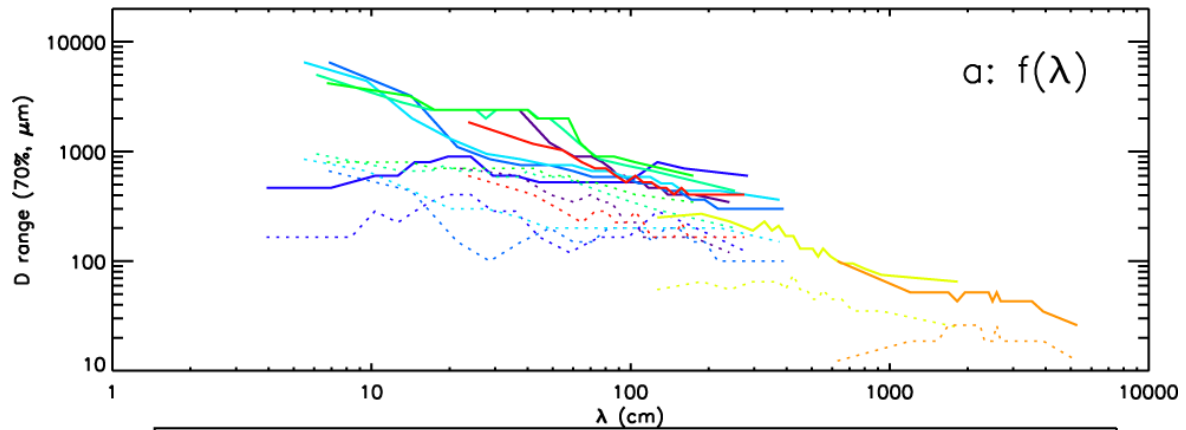
Area Ratio Parameters



Example Terminal Velocity Calculations



V_t Fitting Factors



Mean Terminal Velocities 1000 hPa

