Project Goals

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- cloud microphysical measurements (support POST primary goals)
- entrainment
- drizzle formation
- turbulence/cloud drop interactions
- r_{eff} and dispersion

PDI Specs

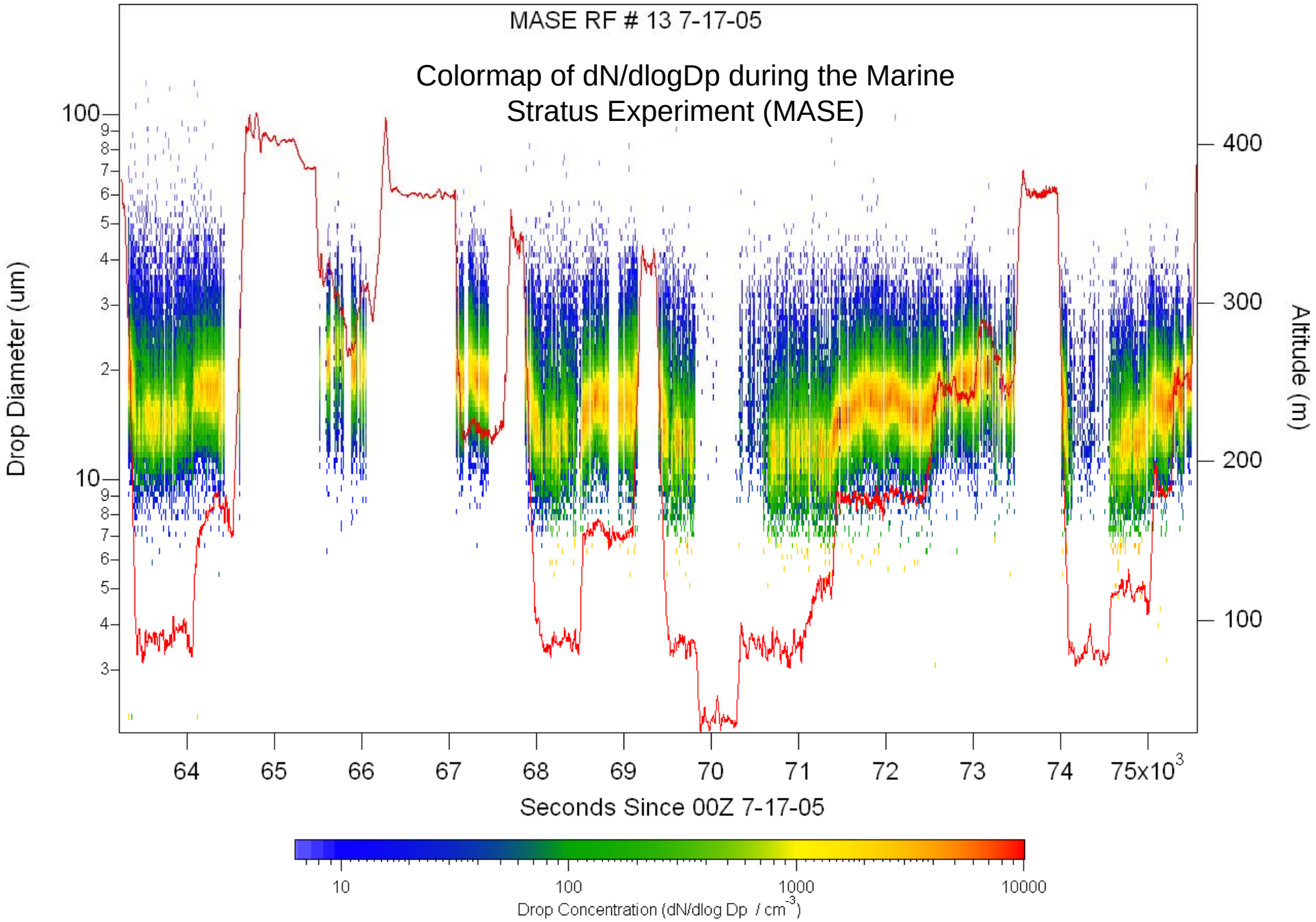
PDI: Phase Doppler Interferometer

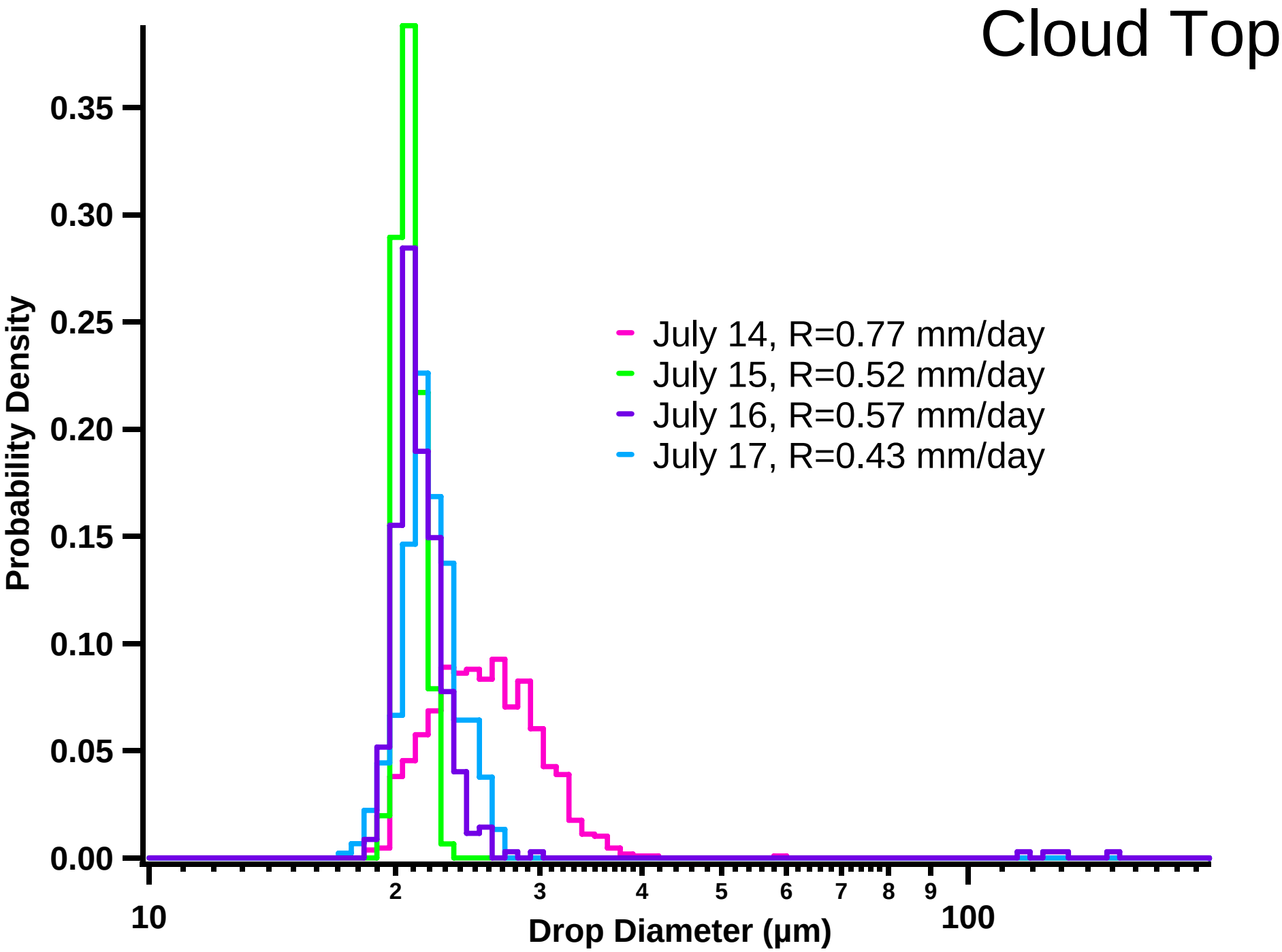
Measures single drop size and velocity

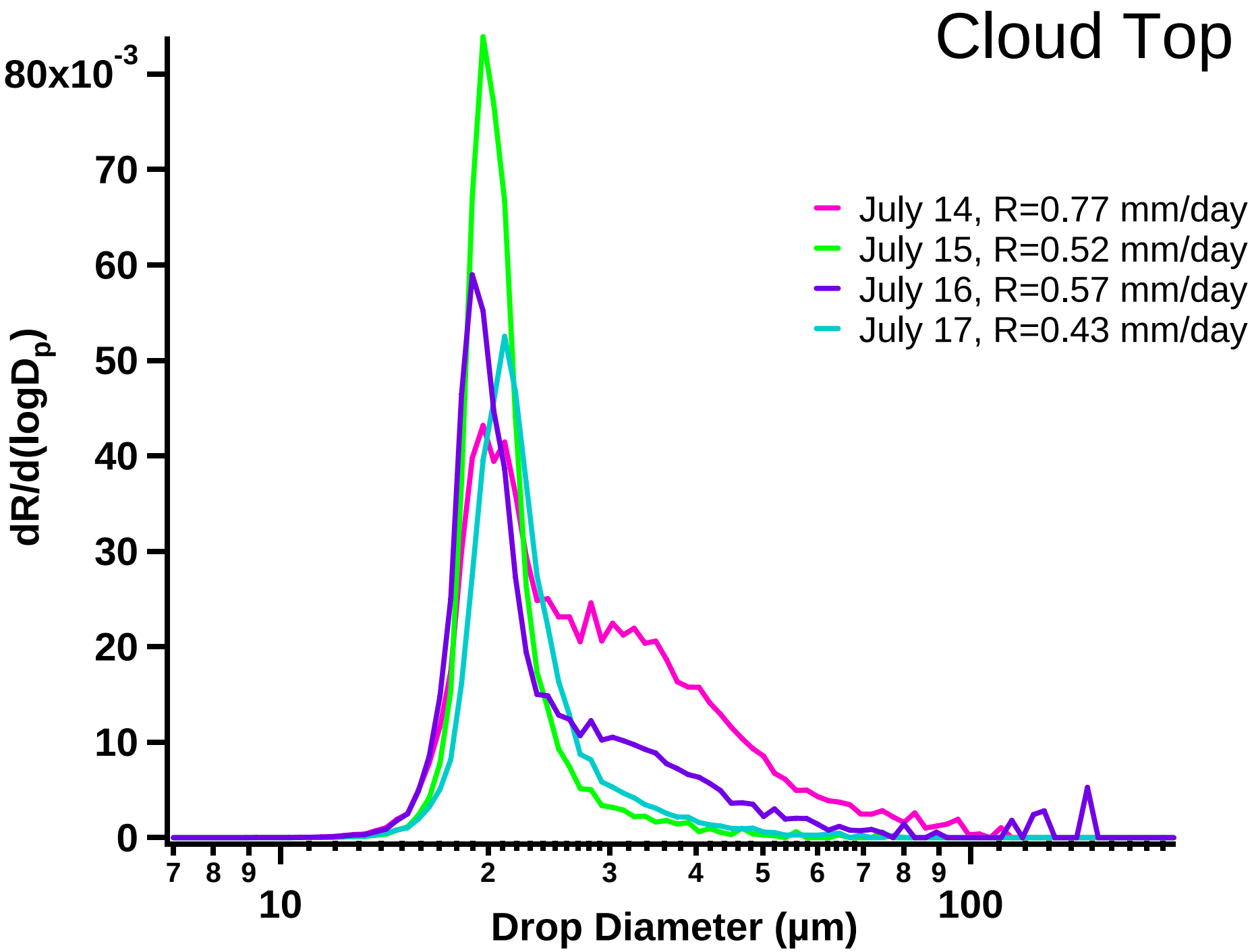
Size range	4 to 200 µm
Sizing uncertainty	1 to 2 µm
Concentration uncertainty	5% + counting uncertainty
View volume	0.5 mm^2 (typical and adjustable)
Coincidence	Minimal
Archive data rate	5 or 10 Hz

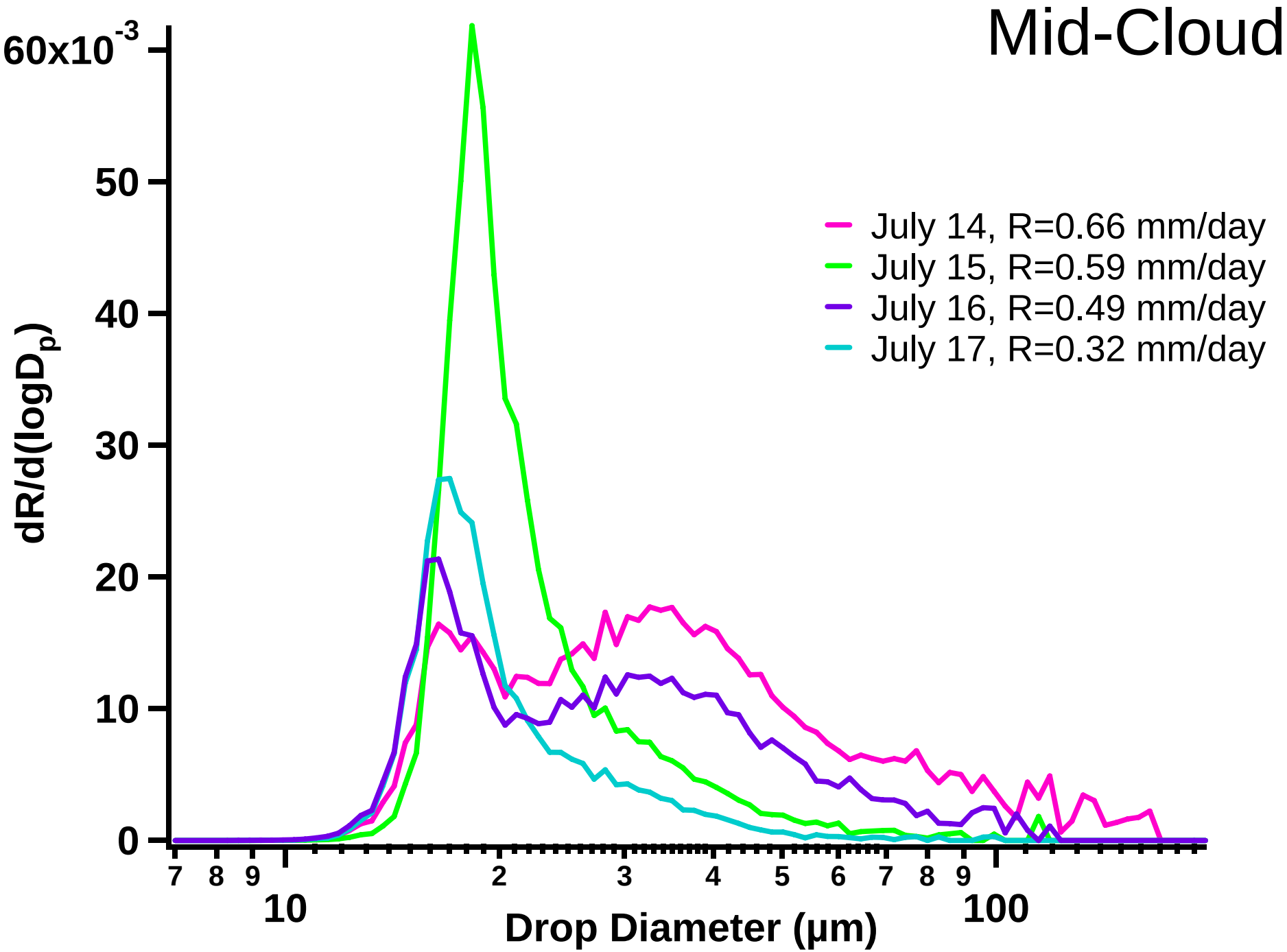
Chuang et al., *Aerosol Sci. Tech.*, in press

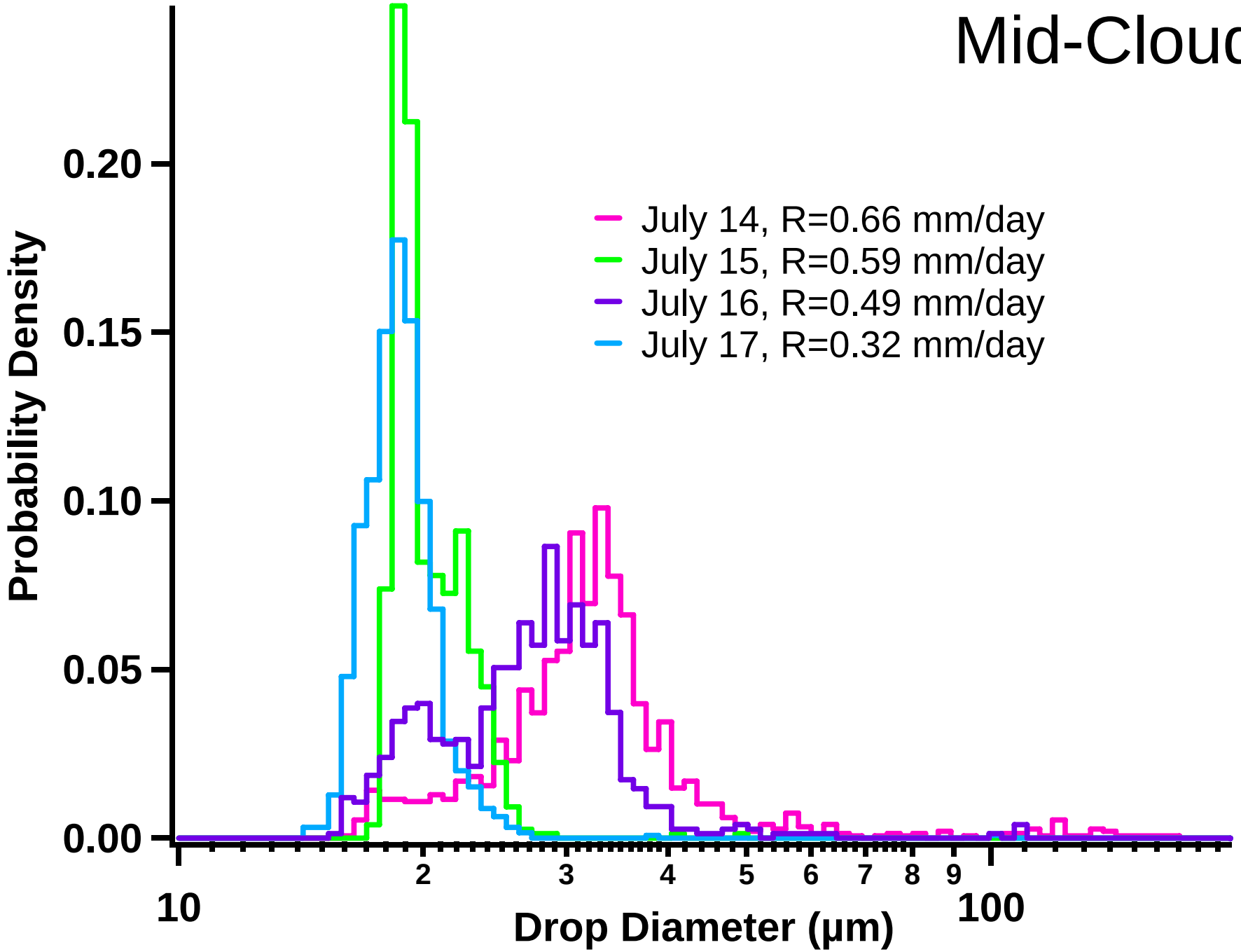
Pre-prints available from my website: people.ucsc.edu/~pchuang/


MASE RF # 13 7-17-05
Colormap of dN/dlogDp during the Marine Stratus Experiment (MASE)
Drop Diameter (um)
100
9
8
7
6
5
4
3
2
10
9
8
7
6
5
4
3
400
300
200
100
Altitude (m)
64
65
66
67
68
69
70
71
72
73
74
75x10^3
Seconds Since 00Z 7-17-05
10
100
1000
10000
Drop Concentration (dN/dlog Dp / cm^-3)


Cloud Top
Probability Density
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
10
2
3
4
5
6
7
8
9
100
Drop Diameter (μm)
July 14, R=0.77 mm/day
July 15, R=0.52 mm/day
July 16, R=0.57 mm/day
July 17, R=0.43 mm/day


Cloud Top
80x10-3
70
60
50
40
30
20
10
0
dR/d(logDp)
July 14, R=0.77 mm/day
July 15, R=0.52 mm/day
July 16, R=0.57 mm/day
July 17, R=0.43 mm/day
7 8 9
10
2
3
4
5
6
7 8 9
100
Drop Diameter (μm)


Mid-Cloud
60x10-3
50
40
30
20
10
0
dR/d(logDp)
July 14, R=0.66 mm/day
July 15, R=0.59 mm/day
July 16, R=0.49 mm/day
July 17, R=0.32 mm/day
7 8 9
10
2
3
4
5
6
7
8
9
100
Drop Diameter (μm)


Mid-Cloud
July 14, R=0.66 mm/day
July 15, R=0.59 mm/day
July 16, R=0.49 mm/day
July 17, R=0.32 mm/day
Probability Density
0.20
0.15
0.10
0.05
0.00
10
2
3
4
5
6
7
8
9
100
Drop Diameter (μm)