Aerosols in Asian Continental Outflow and Marine Air

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Archived Data*

CN < 14 nm
14 < CN < 100 nm
Nonvolatile 14 < CN < 100 nm
Ratio of Nonvolatile to Total CN (14-100 nm)

N (0.1 - 0.5 µm)
N (0.5 - 2.0 µm)
N (2.0 - 20.0 µm)
N (25 -1650 µm)

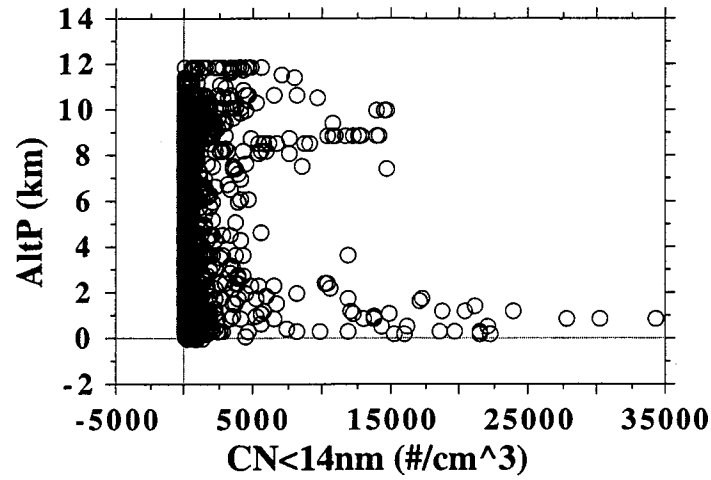
Surface Area (0.1 - 0.5 µm)
Surface Area (0.5 - 2.0 µm)
Surface Area (2.0 - 20.0 µm)
Surface Area (25 -1650 µm)

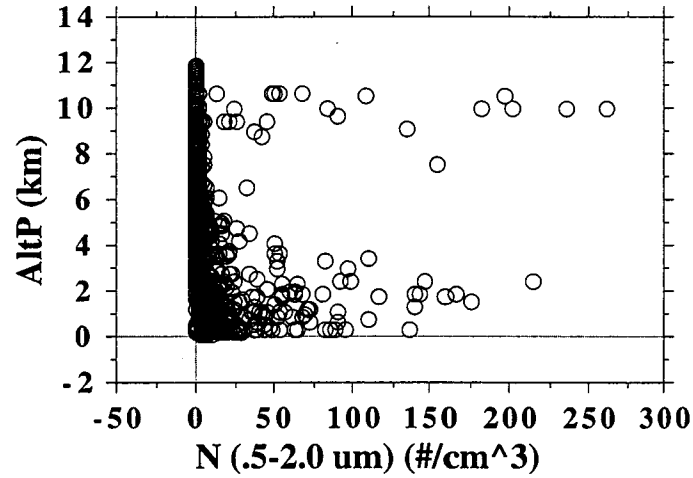
Volume (0.1 - 0.5 µm)
Volume (0.5 - 2.0 µm)
Volume (2.0 - 20.0 µm)
Volume (25 -1650 µm)

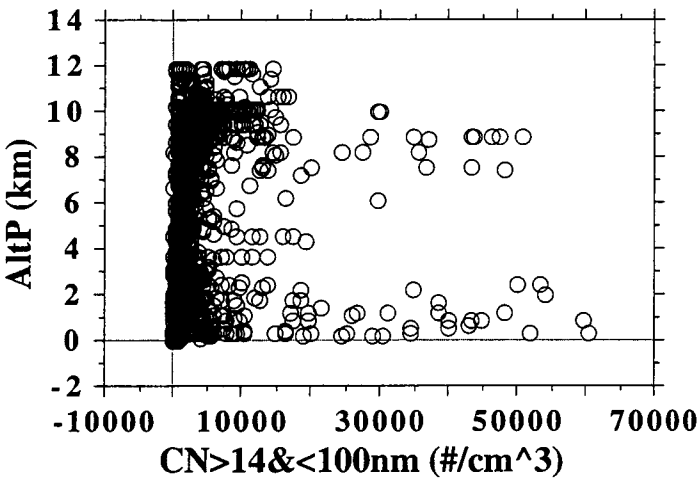
Forward Scattering Coefficients (B):
Blue (450 nm)
Green (550 nm)
Red (650 nm)

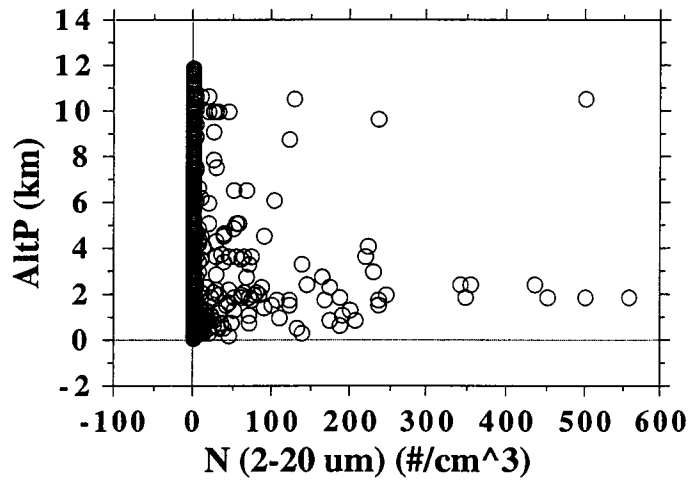
Will Later Submit:
1 minute averaged 10 nm - 10 µm size distributions

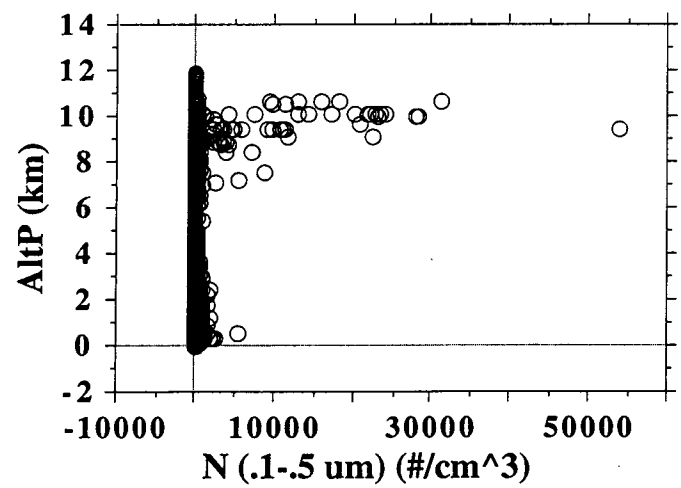
***Data not finalized**

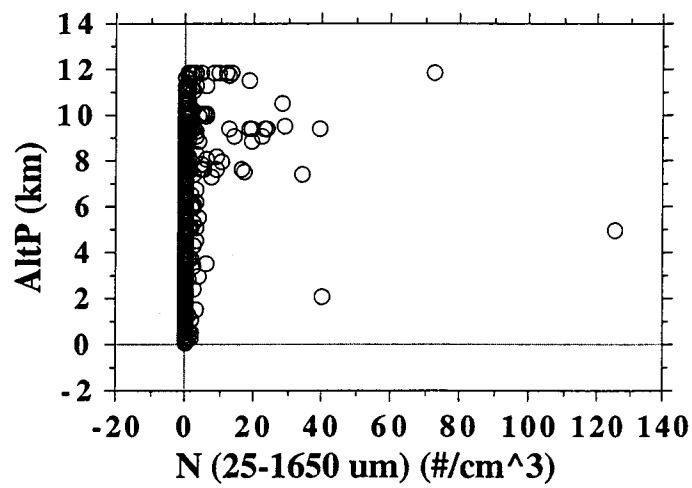

AltP (km)
CN<14nm (#/cm^3)

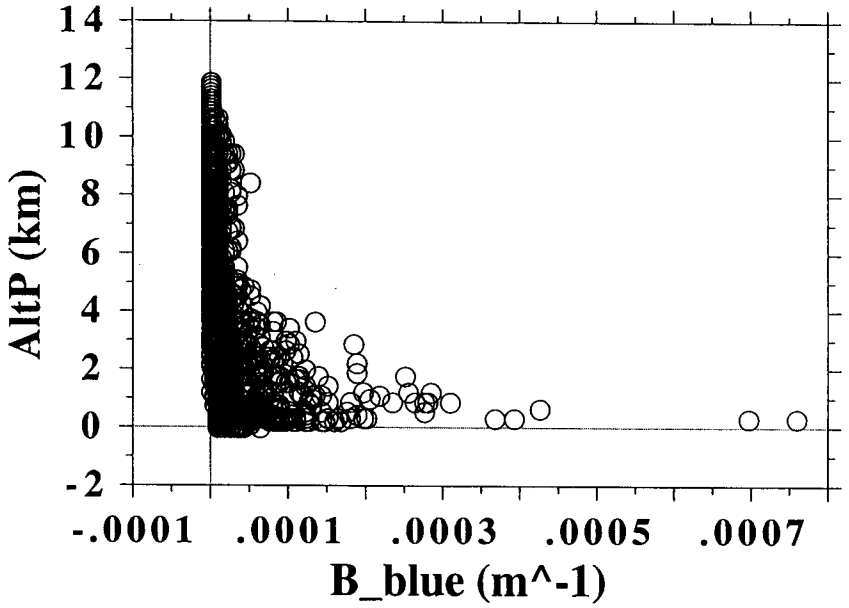

AltP (km)
N (.5-2.0 um) (#/cm^3)

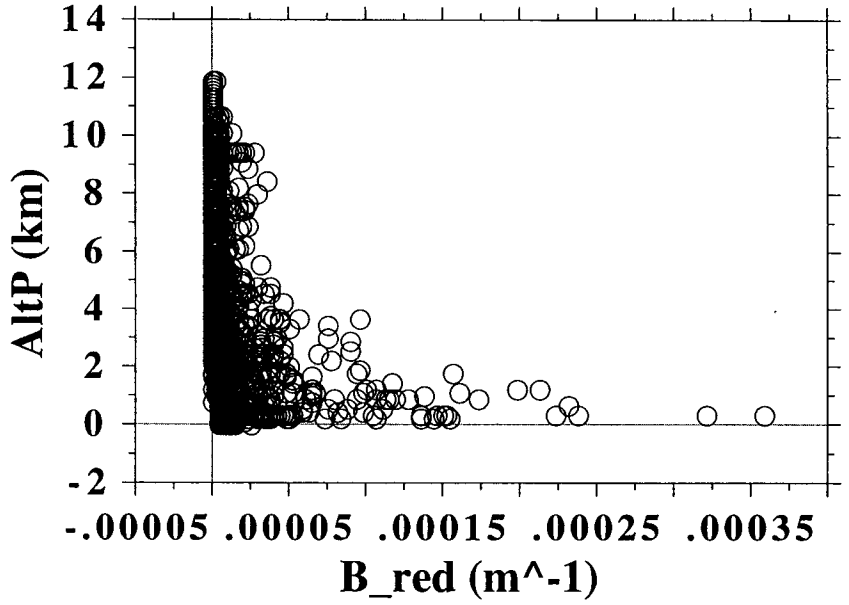

AltP (km)
CN>14&<100nm (#/cm^3)

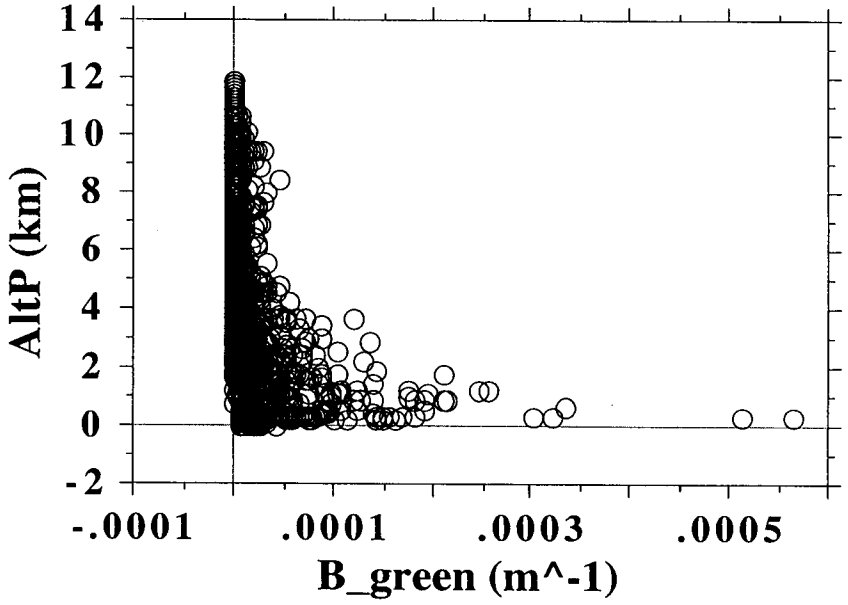

AltP (km)
N (2-20 um) (#/cm^3)

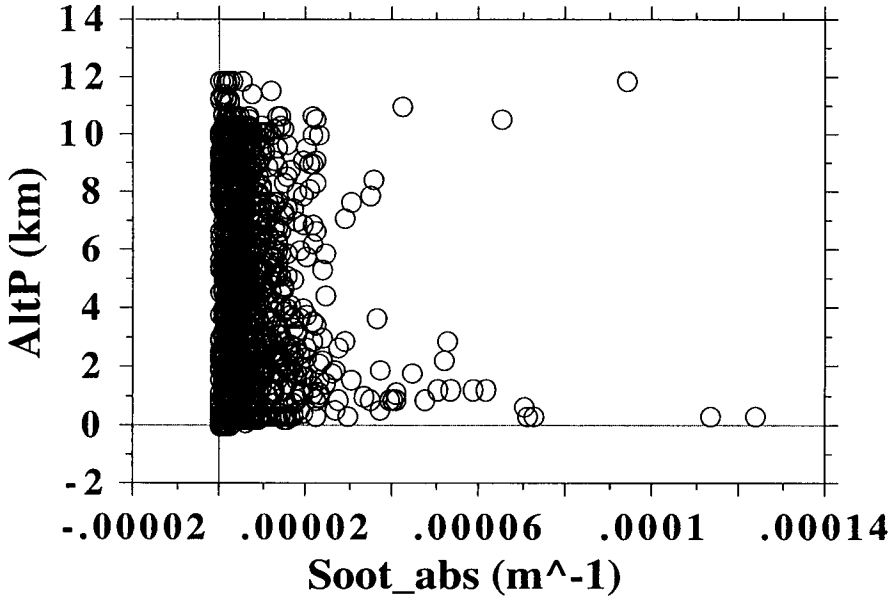

AltP (km)
N (.1-.5 um) (#/cm^3)

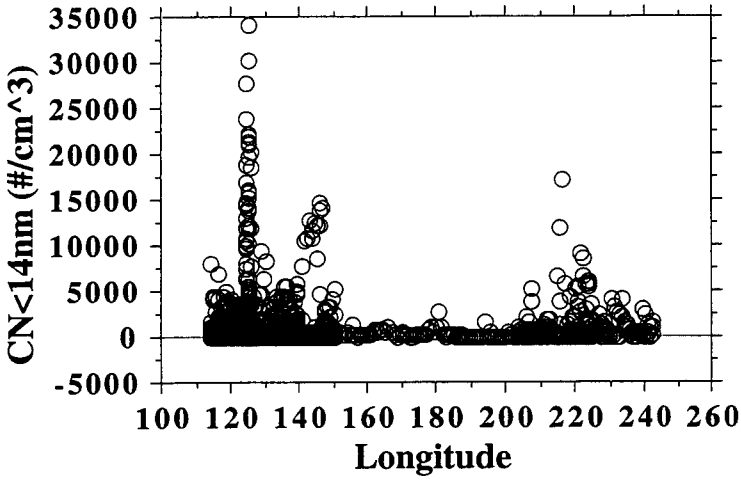

AltP (km)
N (25-1650 um) (#/cm^3)

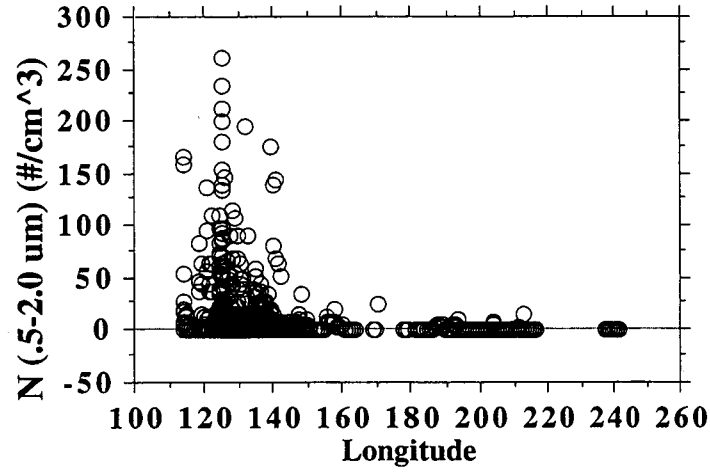

AltP (km)
14
12
10
8
6
4
2
0
-2
-.0001
.0001
.0003
.0005
.0007
B_blue (m^-1)

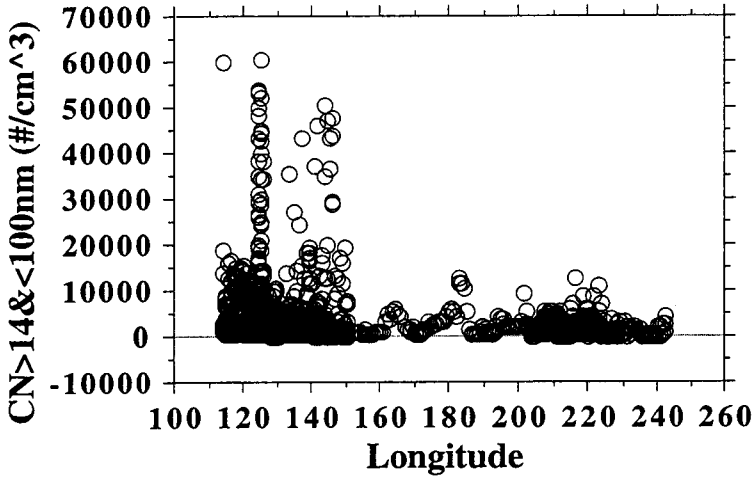

AltP (km)
14
12
10
8
6
4
2
0
-2
-.00005
.00005
.00015
.00025
.00035
B_red (m^-1)

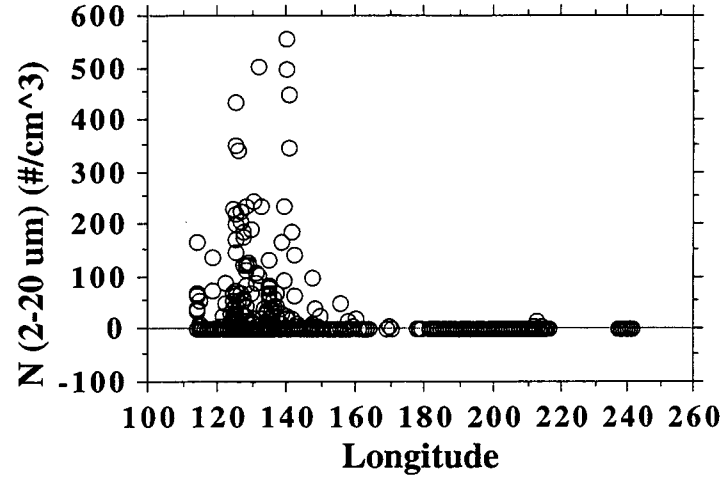

AltP (km)
14
12
10
8
6
4
2
0
-2
-.0001
.0001
.0003
.0005
B_green (m^-1)

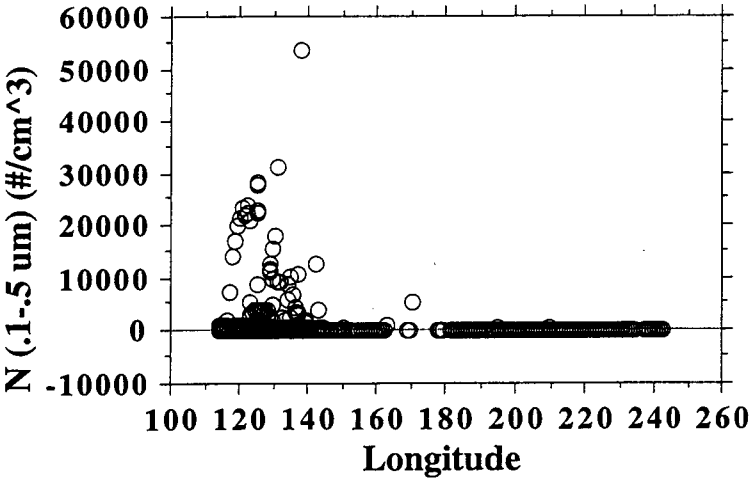

AltP (km)
14
12
10
8
6
4
2
0
-2
-.00002
.00002
.00006
.0001
.00014
Soot_abs (m^-1)

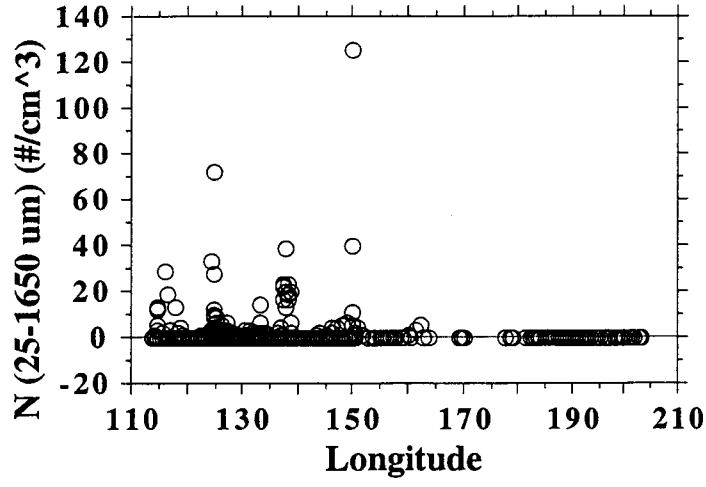

CN<14nm (#/cm^3)
35000
30000
25000
20000
15000
10000
5000
0
-5000
100 120 140 160 180 200 220 240 260
Longitude

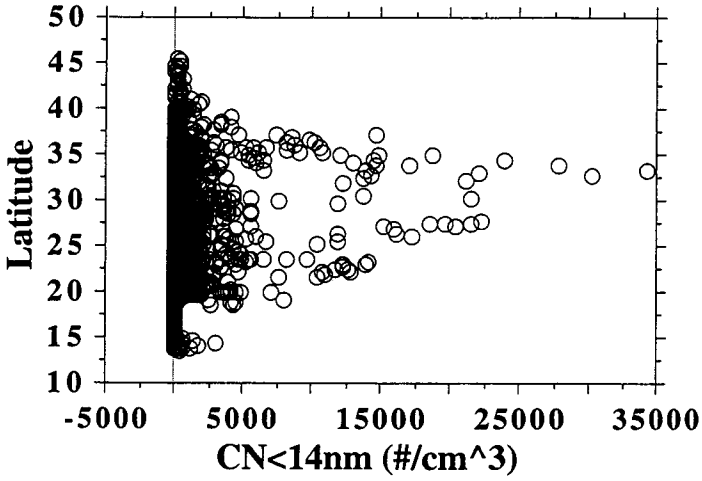

N (.5-2.0 um) (#/cm^3)
300
250
200
150
100
50
0
-50
100 120 140 160 180 200 220 240 260
Longitude

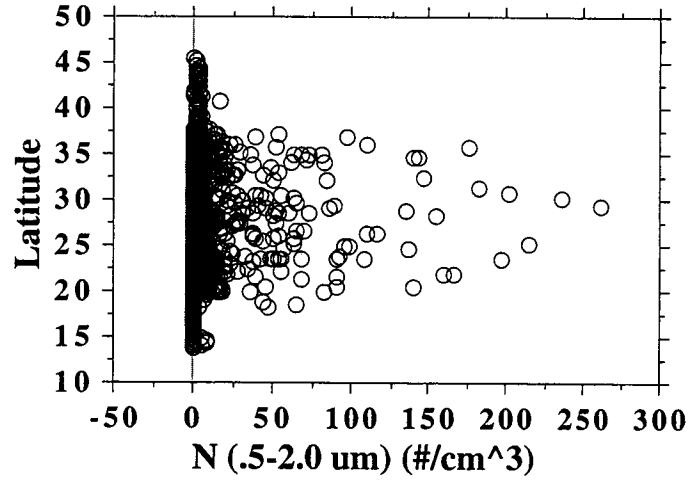

CN>14&<100nm (#/cm^3)
70000
60000
50000
40000
30000
20000
10000
0
-10000
100 120 140 160 180 200 220 240 260
Longitude

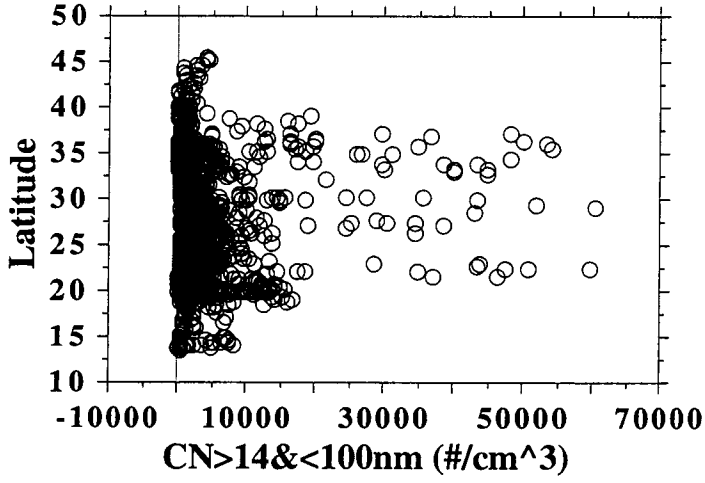

N (2-20 um) (#/cm^3)
600
500
400
300
200
100
0
-100
100 120 140 160 180 200 220 240 260
Longitude

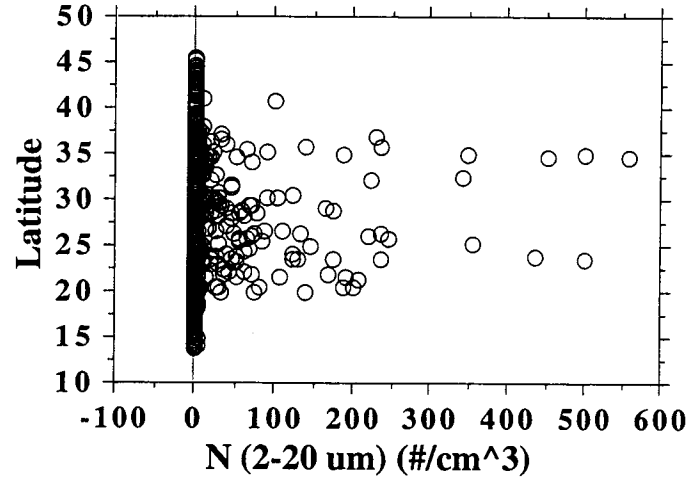

N (.1-.5 um) (#/cm^3)
60000
50000
40000
30000
20000
10000
0
-10000
100 120 140 160 180 200 220 240 260
Longitude

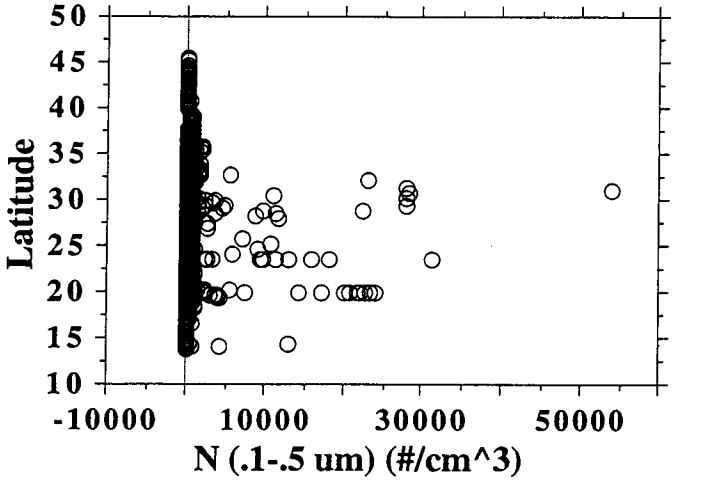

N (25-1650 um) (#/cm^3)
140
120
100
80
60
40
20
0
-20
110 130 150 170 190 210
Longitude

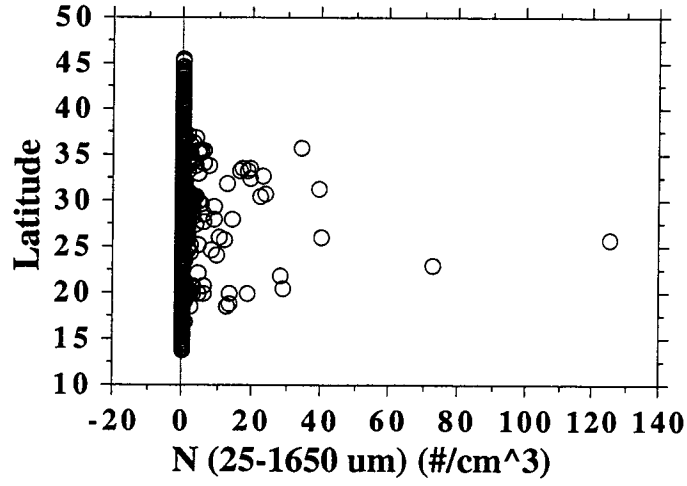

Latitude
50
45
40
35
30
25
20
15
10
-5000
5000
15000
25000
35000
CN<14nm (#/cm^3)

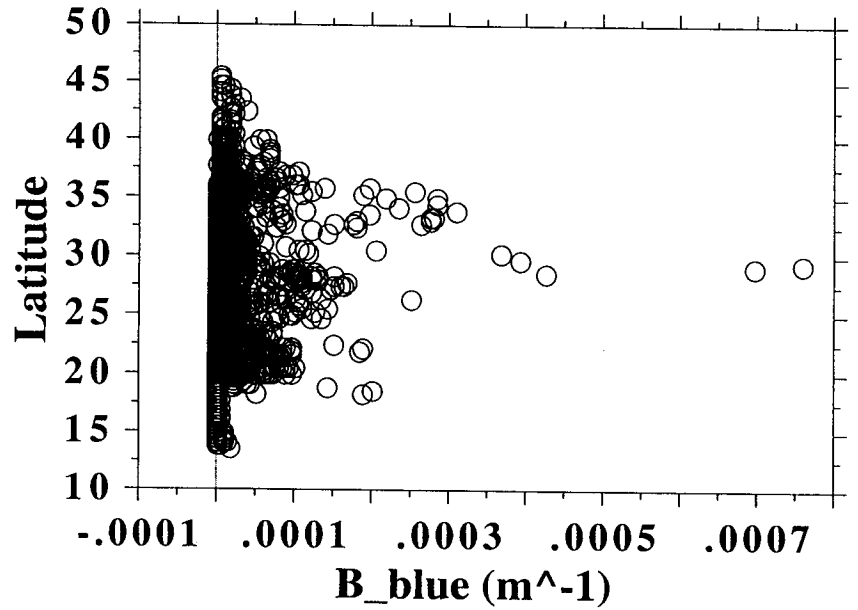

Latitude
50
45
40
35
30
25
20
15
10
-50
0
50
100
150
200
250
300
N (.5-2.0 um) (#/cm^3)

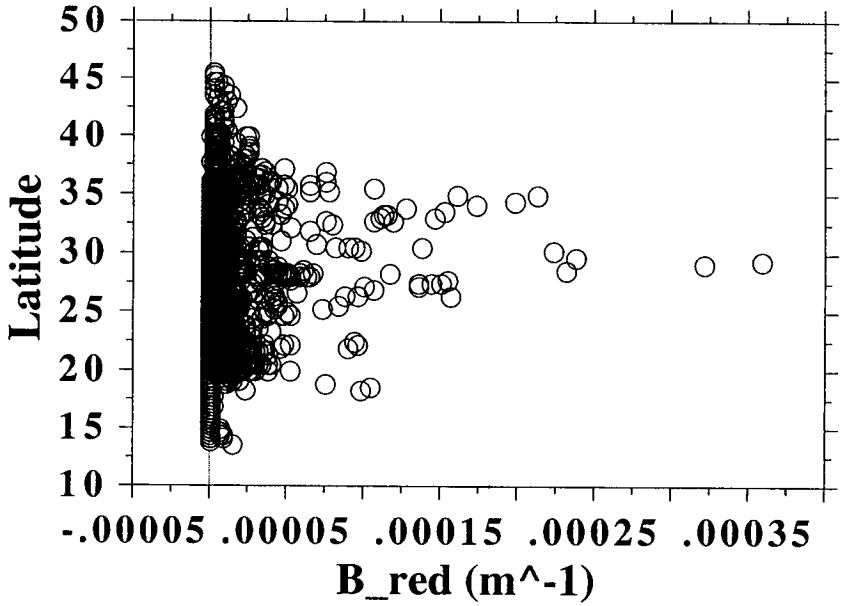

Latitude
50
45
40
35
30
25
20
15
10
-10000
10000
30000
50000
70000
CN>14&<100nm (#/cm^3)

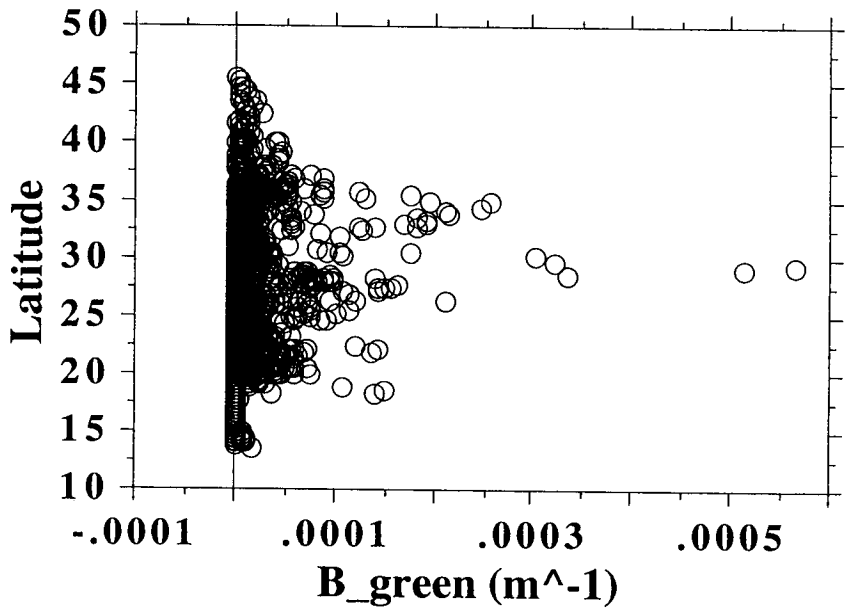

Latitude
50
45
40
35
30
25
20
15
10
-100
0
100
200
300
400
500
600
N (2-20 um) (#/cm^3)

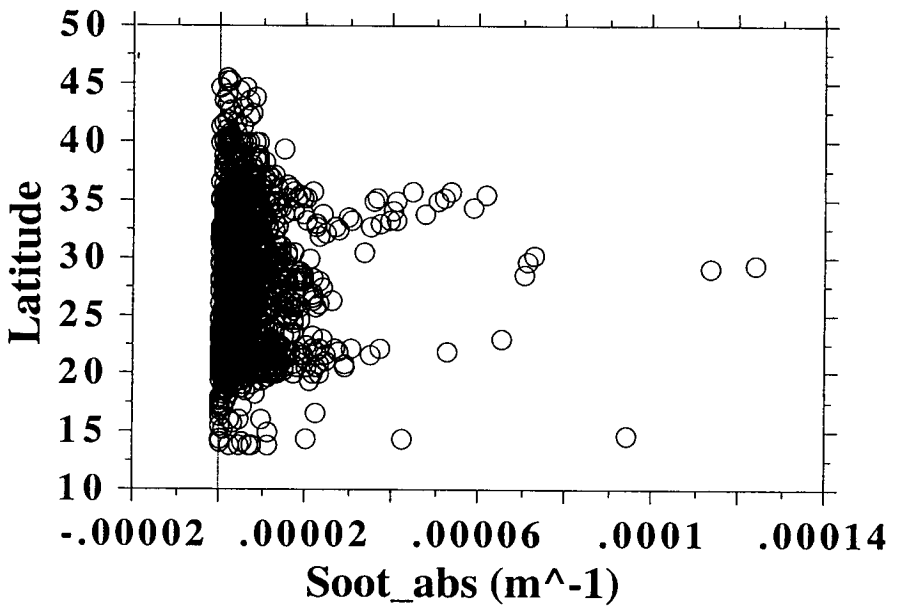

Latitude
50
45
40
35
30
25
20
15
10
-10000
10000
30000
50000
N (.1-.5 um) (#/cm^3)

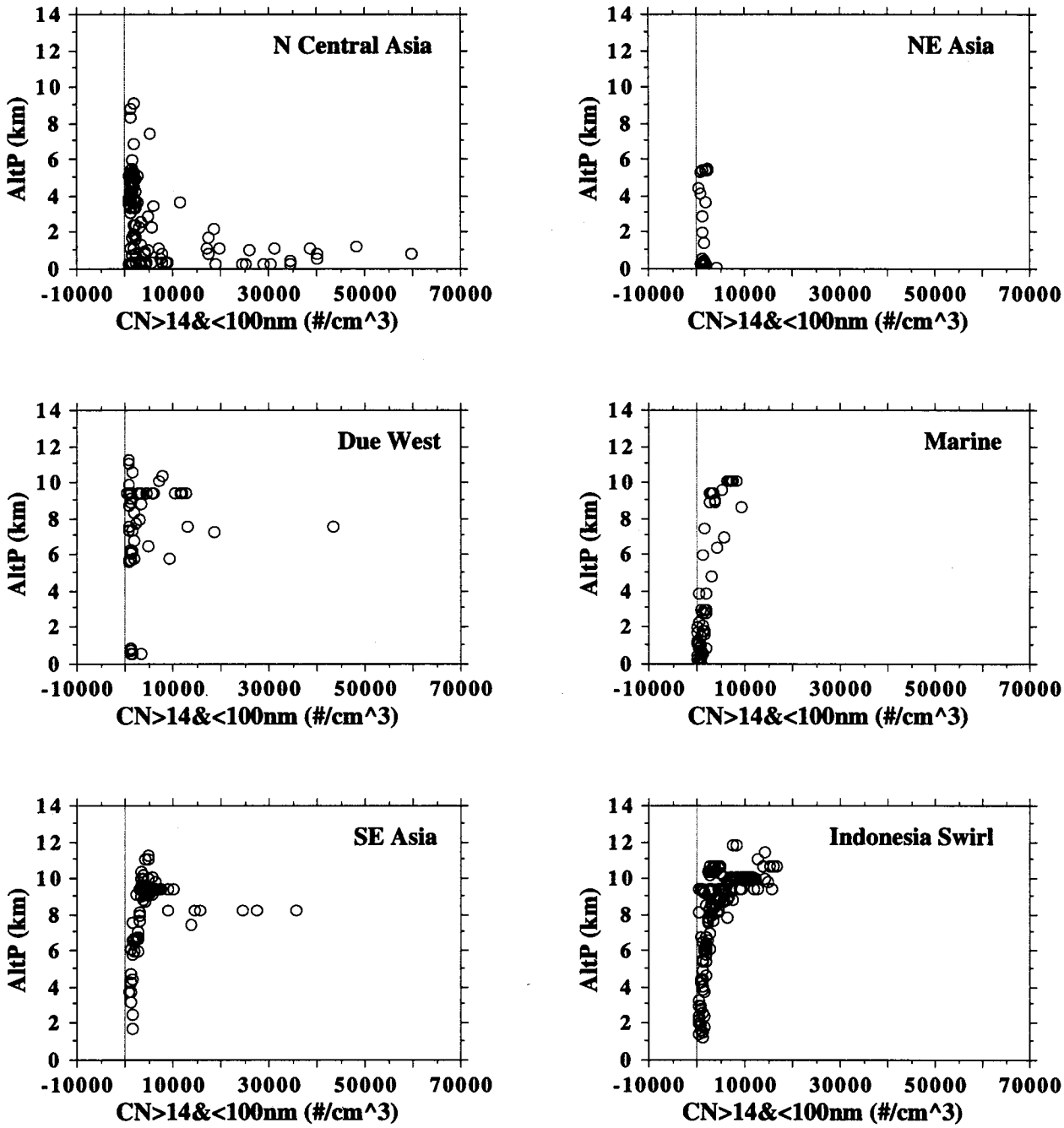

Latitude
50
45
40
35
30
25
20
15
10
-20
0
20
40
60
80
100
120
140
N (25-1650 um) (#/cm^3)

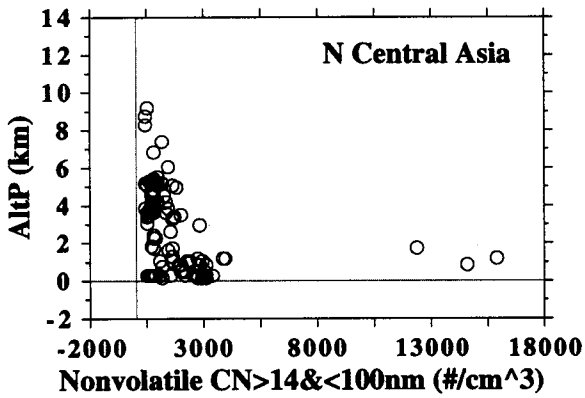

Latitude
50
45
40
35
30
25
20
15
10
-.0001
.0001
.0003
.0005
.0007
B_blue (m^-1)

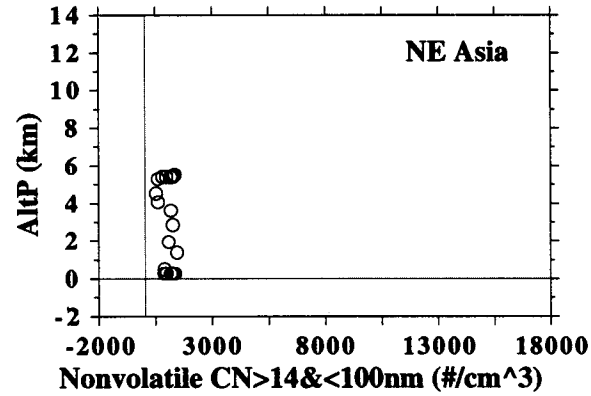

Latitude
50
45
40
35
30
25
20
15
10
-.00005
.00005
.00015
.00025
.00035
B_red (m^-1)

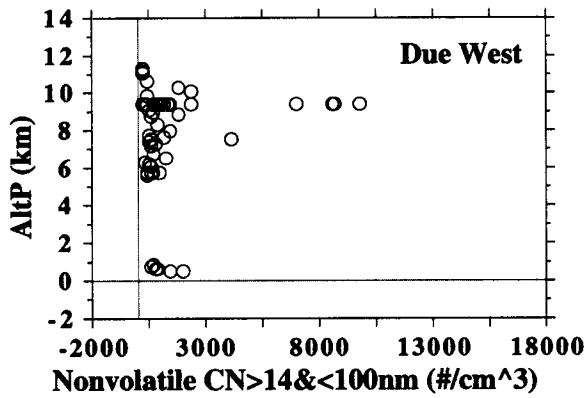

Latitude
50
45
40
35
30
25
20
15
10
-.0001
.0001
.0003
.0005
B_green (m^-1)

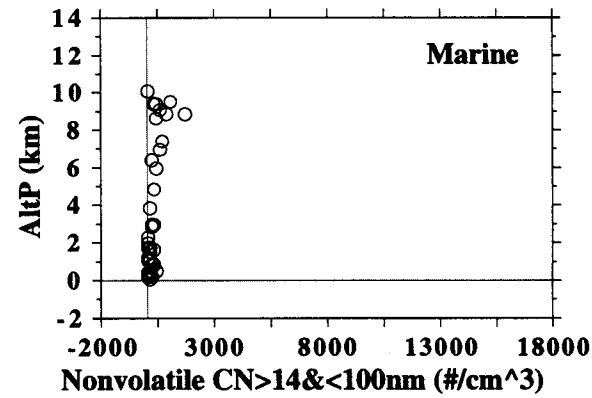

Latitude
50
45
40
35
30
25
20
15
10
-.00002
.00002
.00006
.0001
.00014
Soot_abs (m^-1)

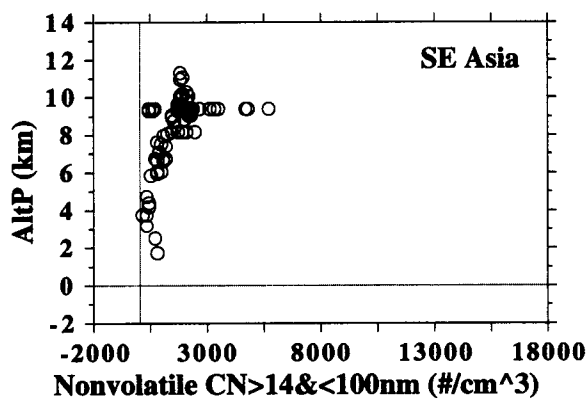

N Central Asia
NE Asia
Due West
Marine
SE Asia
Indonesia Swirl
AltP (km)
CN>14&<100nm (#/cm^3)
0
2
4
6
8
10
12
14
-10000
10000
30000
50000
70000

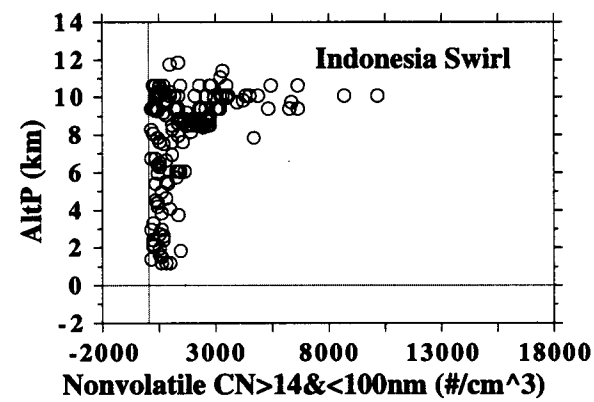

N Central Asia
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)

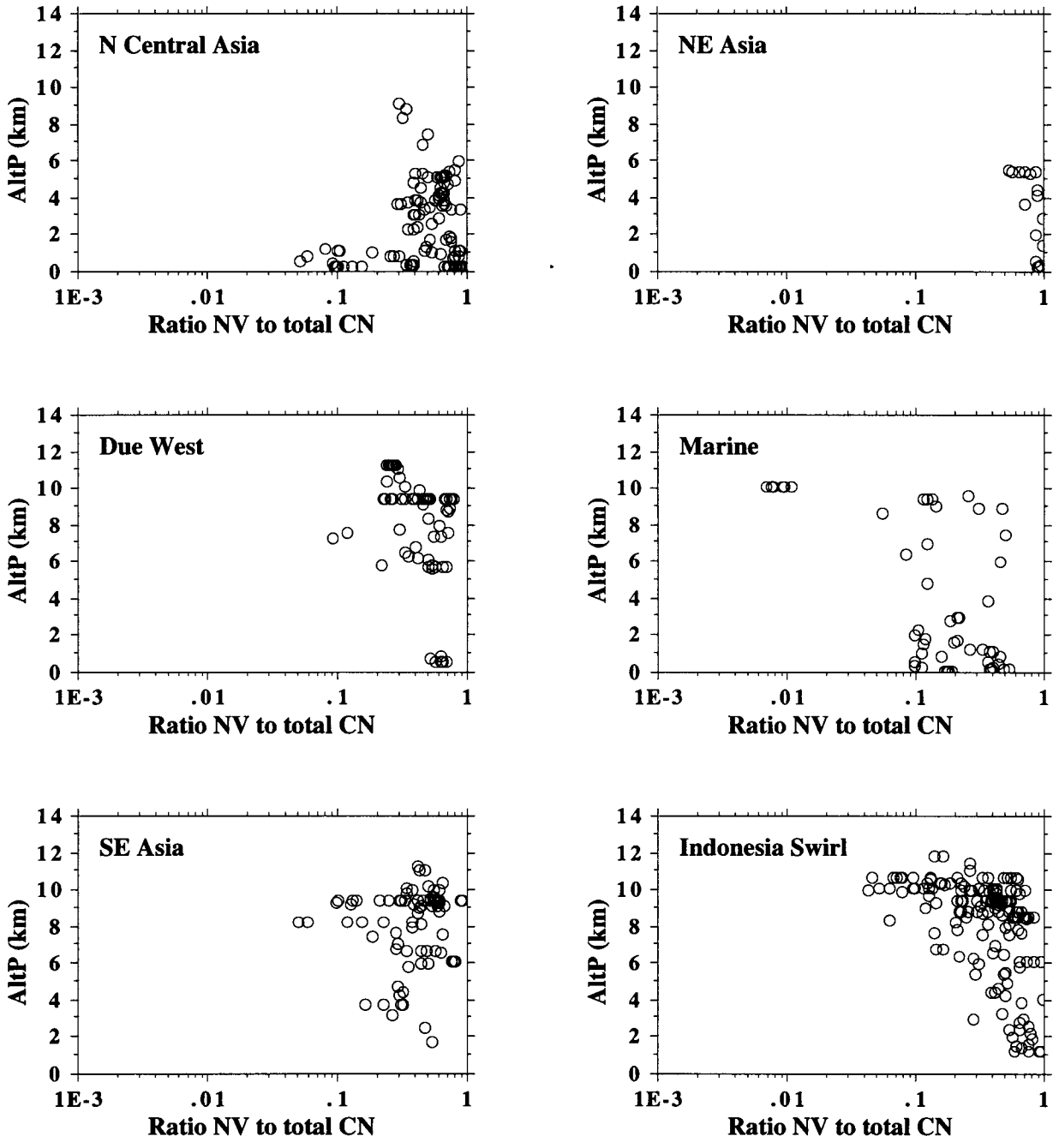

NE Asia
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)


Due West
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)

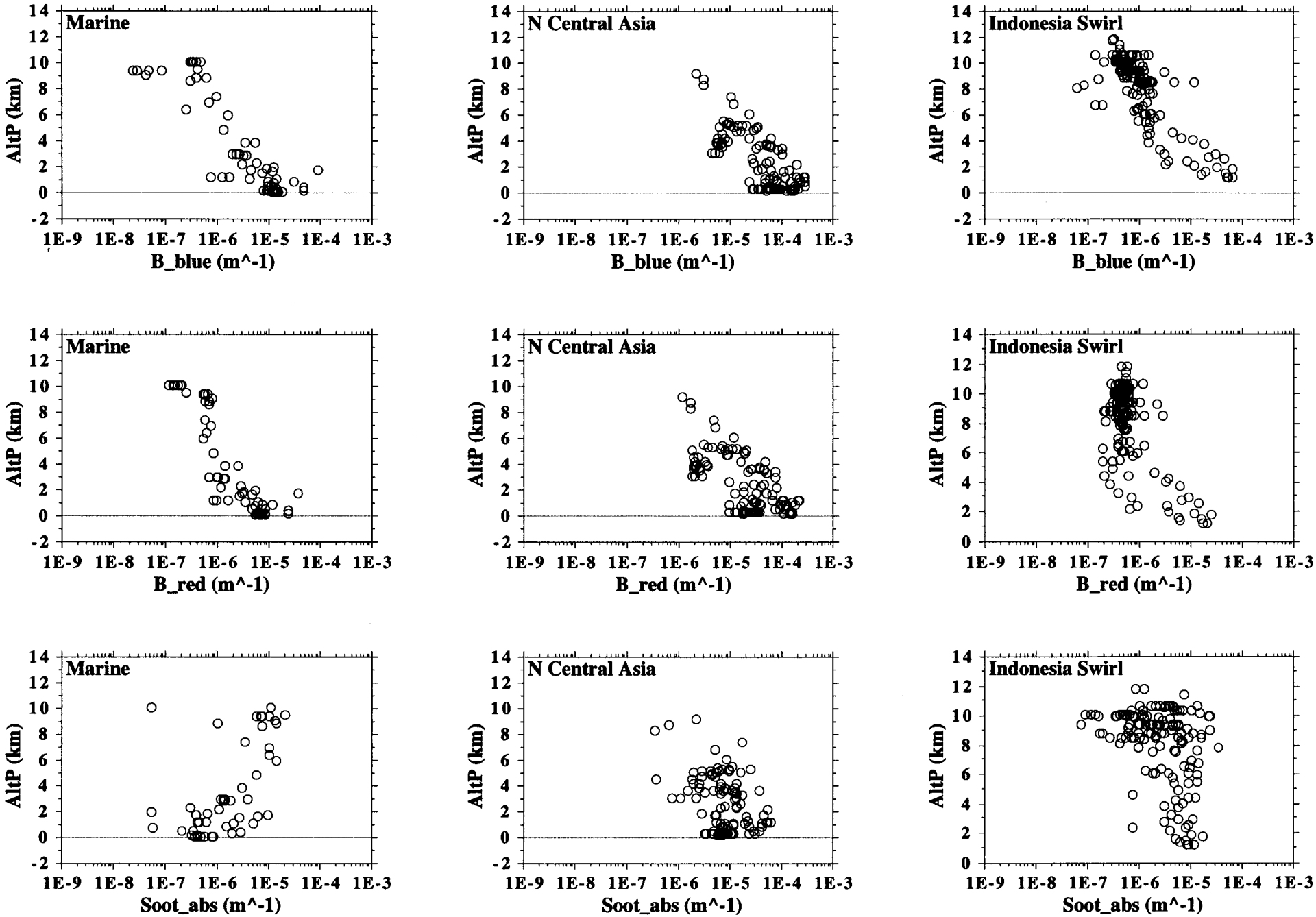

Marine
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)

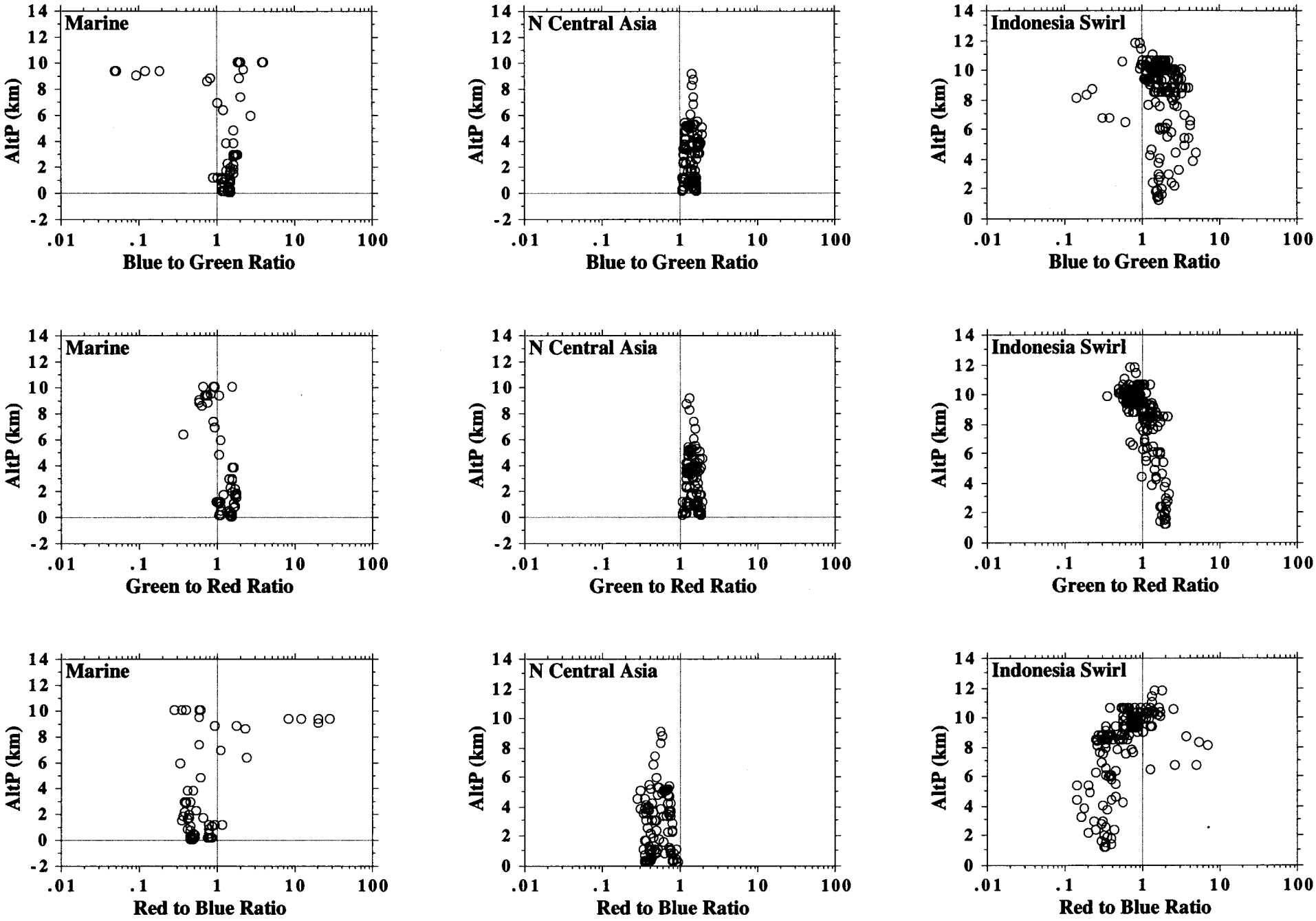

SE Asia
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)


Indonesia Swirl
AltP (km)
14
12
10
8
6
4
2
0
-2
-2000
3000
8000
13000
18000
Nonvolatile CN>14&<100nm (#/cm^3)


N Central Asia
NE Asia
Due West
Marine
SE Asia
Indonesia Swirl
AltP (km)
Ratio NV to total CN
0
2
4
6
8
10
12
14
1E-3
.01
.1
1

	CN < 14 nm (#/cm^3)	14<CN<100 nm (#/cm^3)	Nonvolatile 14<CN<100 nm (#/cm^3)	Ratio of Nonvolatile to Total CN
Coastal	590	931	473	0.57
NE Asia	675	1431	1037	0.83
N Central Asia	2930	6975	1773	0.54
Due West	628	3722	1288	0.44
SE Asia	620	5063	1613	0.43
Indonesia Swir	964	4826	1695	0.42
Marine	182	2064	241	0.21
Mid Pacific	105	1062	687	0.62


Marine
N Central Asia
Indonesia Swirl
AltP (km)
B_blue (m^-1)
B_red (m^-1)
Soot_abs (m^-1)
14
12
10
8
6
4
2
0
-2
1E-9
1E-8
1E-7
1E-6
1E-5
1E-4
1E-3


Marine
N Central Asia
Indonesia Swirl
AltP (km)
Blue to Green Ratio
Green to Red Ratio
Red to Blue Ratio
.01
.1
1
10
100

	B_blue:B_green	B_green:B_red	B_red:B_blue
Coastal	1.50	1.61	0.43
NE Asia	1.53	1.67	0.40
N Central Asia	1.39	1.48	0.53
Due West	1.37	1.32	0.64
SE Asia	1.61	1.31	0.72
Indonesia Swir	1.87	1.10	0.77
Marine	1.43	1.21	2.01
Mid Pacific	1.00	1.28	1.03

Future Work

Clean up classification

Couple our aerosol data with chemical observations for each source region

Investigate whether scattering coefficients can be used to identify aerosol populations in terms of broad chemical types (e.g., soot, dust, sulfates)

Look at the time evolution of the aerosol population

Estimate horizontal fluxes and deposition of aerosols as continental outflow moves out over the Pacific

Compare our TRACE-P data to that of PEM-West missions to look for secular changes in aerosol loading

Compare our TRACE-P data to TRACE-A to look for regional differences in aerosol loading

Collaborate with modelers to better understand our observations and to evaluate the representation of aerosols in the models