

## P1-25 Characteristics of Wintertime Polar Stratospheric Aerosols observed by Lidar and Optical Particle Counter (OPC) in Eureka

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### summary

Height profiles of wintertime polar stratospheric aerosols were observed in Eureka (80° N, 86° W) by lidar and optical particle counter (OPC). The observation campaigns have been carried out in every January since 1996. Location of the observation site, characteristics of the instruments, and observation times are shown in Table1.

Figure1 shows an example of size distribution of the stratospheric aerosols observed by OPC on January 4 - 5 in 1997. We assumed the size distribution to be a bimodal log normal distribution. To find parameters which characterize the bimodal distribution, it was needed to get 6 independent data by the observation. In most cases, however, channel of the largest particles

(radius > 1.8 micron), that is the fifth channel of the OPC, had no data in the stratosphere. So, only 4 channel of the OPC data were usable in the analysis, and, of course, it was not enough to determine the bimodal distribution. To make up for the shortage of the data, we used additional 2 kinds of data obtained by 2 wavelengths (532 and 1064 nm) lidar. Using the 6 kinds of independent data, we determined the parameters of the distribution.

Figure2 shows lidar backscattering coefficient for the wavelength of 532nm, and an estimated backscattering coefficient related to the size distribution in Figure1. In this case, backscatter to extinction conversion factor is 35 for 532nm, and 39 for 1064nm.

Results of the analysis about the relations between lidar backscatter and extinction, total surface area and

total volume of the aerosols will be shown in the presentation.

Location			
Eureka (80° N, 86° W) (Canadian Arctic)			
Lidar	Arctic Stratospheric ozone Observatory (A StrO)		
OPC	Eureka Weather Station		
Instruments			
Lidar	Nd : YAG Lidar ( $\lambda = 1064\text{nm}, 532\text{nm}$ )		
OPC	Balloonborne Optical Particle Counter Channel : $r \geq 0.15, 0.25, 0.4, 0.6, 1.2 \mu\text{m}$		
Observation			
Year	Month	Date	Time (Local Time)
1996	January	6 ~ 7	22:42 ~ 00:53
	January	9 ~ 10	00:49 ~ 02:50
1997	January	4 ~ 5	00:01 ~ 02:07
	January	10	18:26 ~ 20:32
1999	January	19 ~ 20	22:17 ~ 01:19
	January	24 ~ 25	22:11 ~ 01:06

Table1

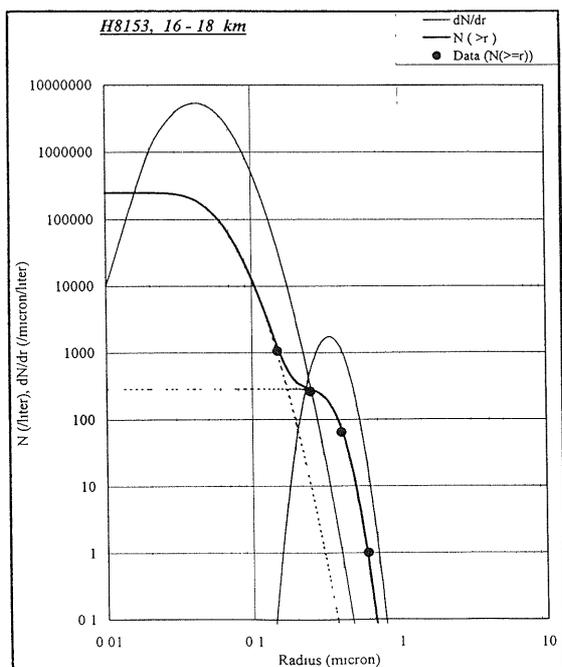


Figure1  
Exsample of size distribution observed by OPC on January 4~5 1997

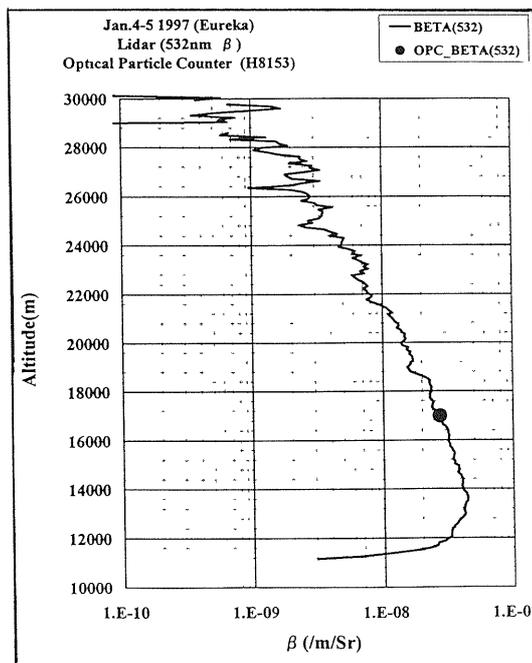


Figure2  
Backscattering Coefficient observed by Lidar, and an estimated value related to the size distribution in Figure1