

EL CHICHON AEROSOLS IN THE STRATOSPHERE:  
ANALYSES OF LIDAR DATA AND CALCULATIONS  
OF RADIATION BUDGET

M. Fujiwara, H. Akiyoshi and N. Otsuka  
Department of Physics, Kyushu University  
Fukuoka 812, Japan

Lidar observation at Fukuoka (33°N, 130°E) has provided over four years the data of El Chichon aerosols in the stratosphere. Analyses of the data show that an enormous amount of volcanic aerosols has continuously decreased since the beginning of 1983 with significant fluctuations. These fluctuations reveal themselves as a seasonal variation of aerosol content with a maximum in winter-spring and a minimum in summer. The vertical structure of the aerosol layer also shows the seasonal variation. Although the height of a peak around 18 km in the vertical profile of scattering ratio shows little variation, the higher second peak appears frequently from late fall and the lower third peak from late winter to late spring just as two and more tropopauses appear in these periods. The mechanism which causes the seasonal variation will be discussed in terms of the transport by the atmospheric circulation and the removal through the tropopause gap.

Radiation budget in the atmosphere has been calculated taking into account the large amount of aerosols observed in the early stages of the El Chichon event. The heating rate of the atmosphere is more than 1K in the bottom region of the stratosphere even in the nighttime. The possible effect of the volcanic aerosols on the other geophysical phenomena will be discussed using the calculated values of the heating rate.

On 29 November 1985 the Ruiz eruption cloud was detected at Fukuoka. Results of succeeding observations of this new volcanic cloud will be presented.