

## The chemical characteristics of Background Kosa

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Matsuki et al., (2003) discovered a significant amount of Kosa particles in the high altitude by employing the airplane and Lidar observations, but the amount of Kosa particles have not been reported by any ground based stations and considered to be transported high up over the Japan Islands. They named the phenomenon as 'Background Kosa' to differ it from the normal type of Kosa. We observed Background Kosa several times from the results of a throughout-a-year aerosol sampling at the summit of Mt. Fuji and back trajectory analysis. Here we discussed the chemical characteristics of the background Kosa.

The summit of Mt. Fuji(3776m, a.s.l.) is an isolated peak and is considered to be in the free troposphere most of time. There is almost no influence of local human activities and/or vegetation. The summit is supposed to receive the upper air mass over East Asia transported directly to the free troposphere.

Aerosol samples were collected at the Mt. Fuji weather station located at the highest hill of the summit using a high volume air sampler (ca.700 L/min) on quartz filters, from July 2001-September 2002. Filters were renewed once every week from July till in March, 2002 and then, everyday until the middle of March. Major ionic species ( $\text{Na}^+$ ,  $\text{NH}_4^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{Cl}^-$ ,  $\text{NO}_3^-$  and  $\text{SO}_4^{2-}$ ) were determined with ion chromatography.

High concentrations of  $\text{Ca}^{2+}$  of aerosols were observed on the days of the Background Kosa. From the results of chemical analysis ( $\text{SO}_4^{2-}$ ,  $\text{Ca}^{2+}$ ,  $\text{NH}_4^+$ ), we concluded that Ca was in the form of  $\text{CaCO}_3$ . This is in good contrast with normal Kosa, where most of Ca is in the form of  $\text{CaSO}_4$ . During Kosa periods an air mass was transported through industrial areas in China and was mixed with polluted air on the way from deserts to Mt. Fuji, whereas in the case of the Background Kosa, unreacted and fresh  $\text{CaCO}_3$  mixed externally with  $\text{SO}_4^{2-}$  which had been already reacted with  $\text{NH}_4^+$  before the mixing.