

Continuous Measurements of Atmospheric Charged Particle (Aerosol) (1)-The Relation between Atmospheric Ions and Earthquake-

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Atmospheric ions were formed from ionization of radiation. Aerosol is floating in the atmosphere. Atmospheric ions absorbed on the surface. Therefore, aerosol is charged positive or negative. These are known generically as charged aerosol. Since the October of 1997, we have installed an Ion Counter of Model KSI-3500 and the characteristics of atmospheric air have been continuously monitored for positive and negative aerosol distributions (3 channel) and densities. It compared and analyzed data of charged aerosol densities and the recent earthquake.

Anomalous density changes of radon were observed prior to the Southern Hyogo Prefecture earthquake (Yasuoka et al., 1996). The relation between anomalous variation of radon concentration and earthquake are well known. However, it's difficult to spread the monitoring area. And, anomalous density changes of atmospheric charged aerosol were also observed in Kobe (Sathutani, 1996).

Atmospheric ions were formed from ionization of radiation. That radiation is released from radioactive nuclide in the crust or atmosphere. Radium-226 is a radioactive nuclide in the crust. Radium disintegrates radon-222. And, radon is released into atmosphere that is radioactive nuclide, too. Aerosol is floating in the atmosphere. Atmospheric ions absorbed on the surface. Therefore, aerosol is charged positive or negative. These are known generically as charged aerosol.

Since the October of 1997, we have installed an Ion Counter of Model KSI-3500 and the characteristics of atmospheric air have been continuously monitored for positive and negative aerosol distributions (3 channel) and densities. It compared and analyzed data of charged aerosol densities and the recent earthquake (March - December 1998).

The subject of earthquake decided within the distance of 300 km from Okayama. It occurred many earthquakes in this monitoring term. The number is 82. And, it observed that large ion ratio and the charged aerosol density for positive and negative, prior to earthquake. These density changes were also observed prior to the Southeast Hyogo Prefecture earthquake (M=4.2) on March 4, 1998. The Ion Counter recorded 2030 (positive charged aerosol) - 1830 (negative charged aerosol) ions/cc on March 3, 1998. The large ion ratio increased about 80 % at same time.

The Mino Gifu Prefecture earthquake (M=5.2) on April 22, 1998 had the fore and after shock. The charged aerosol density and large ion ratio increased on April 19. After that the charged positive and negative aerosol density was recorded as usual. An earthquake of M=3.6 occurred, when fifty hours have passed since the anomaly start. If this earthquake is fore shock, the principal earthquake occurred after twenty-six hours. After shock occurred three times. It is considered to be one of case with the fore and after shock.