

Variation of ion content concentration associated with earthquakes

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Recently, variations of ion content concentration associated with earthquakes have been reported. But these phenomena are based on case studies and have not been verified scientifically and statistically. It is considered that atmospheric radon, which gives the biggest contribution to ionization of atmosphere at the Earth's surface, is connected to generation of ion. And it has been reported that atmospheric radon concentration increases before Kobe earthquake (Yasuoka 1996). In our preliminary observation at Iyogatake (southern part of Chiba), atmospheric radon concentration and ion content concentration show good correlation in daily variation. Therefore, it is reasonable that ion content concentration may increase associated with large earthquakes. And ion may play a significant role in the Lithosphere-Atmosphere-Ionosphere coupling which is suggested as a mechanism that causes electromagnetic phenomena associated with earthquakes. So, we start to investigate the relationship between earthquakes and variation of ion content concentration in statistical approaches. We utilize the COM-3700, produced by Com System Inc., to observe ion content concentration at 3 stations in Japan, Akishima (Tokyo), Kiyosumi (southern part of Chiba) and Uchiura (southern part of Chiba). The principle of the observation is Gerdien tube, with 4 sec. sampling. And we measure only positive ions.

Only night-time data are utilized to analyze in order to prevent contamination of artificial facts. We analyzed mainly Akishima data, because of the longer observation (2 years). We use integrated value of night-time (0:00~5:00 LT) data in order to evaluate relationship between the occurrence of an earthquake and appearance of anomalous value of ion content concentration possibly.

Although it is a short period, we examine spatial variation of ion content concentration associated with the 2009 earthquake swarm occurred at the off shore of the East of Izu Peninsula (Dec.) with 2 stations data at Akishima and Kiyosumi.

The detailed results will be shown in our presentation.