

The interrelation of Micro-earthquakes and an Atmospheric Ion Change before The Western Tottori Prefecture Earthquake in 2000

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We began to grapple with earthquake prediction since 1997. It was reported that an anomalous atmospheric ion change in Kobe City before Kobe Earthquake (Satsutani, 1996). The Western Tottori Prefecture earthquake (M7.3) occurred on October 6, 2000. Since October of 1997, we measured an atmospheric ion continuously at Okayama University of Science (OUS). We found an unusual ion data. Further, when an ionic occurrence began to be active, a micro-earthquake on the Western Tottori Prefecture region occurred simultaneously. We think these events are very useful tool for earthquake prediction. In this time, we studied both relation between an atmospheric ion and a micro-earthquake.

It was unusual that the seismic activity and the change of atmospheric ion before the Western Tottori Prefecture Earthquake. First, we researched the large ion (positive charged ion) from October of 1999 to September of 2000. The Ion Counter has been changing usually by 500 – 2000 ion/cc. As the background, high-density ion was observed 25 times value more than 3000 (positive charged ion) ion/cc. And the July of 2000, only one month, it was observed 13 times.

On July 11, ion density recorded 11,105 ion/cc. After 6 days, the earthquake of M4.3 was occurred on July 17 in the area of Western Tottori Prefecture area. This area in this period was most active in our experience. There was no seismic activity place except for this area. Because of the anomalous high ion density, we supposed a big earthquake was forthcoming, is a foreshock. We had forecasted that a large earthquake of about the M6.5 on this area within 2 weeks. Finally, it was after 90 days that the mainshock occurred. In this verification, we used hypocenter-data by Japan Meteorological Agency (JMA) and dealt with hypocenter-data by using the “SEIS-PC for Windows 95” (Ishikawa et al. (1997)).

This presentation shows that an atmospheric ion becomes active before a micro-earthquake. Therefore, we think that a large earthquake will be predicted by following a step. First step : The occurrence of a high-density atmospheric ion before a large earthquake. Second step : Finding a micro-earthquake occur activity area in the about same time. Third step : Specifying of seismic center.

But, not all of the large earthquake has a foreshock. It is necessary to find how to predict such a type of earthquake.