
CHAPTER 5

DISCUSSION AND CONCLUSION

Observed radon concentrations consist of radon fluctuations due to meteorological parameters and radon concentrations associated with earthquakes and other causes. This study used the mathematical model of Pinault to estimate radon concentration due to atmospheric pressure, precipitation, and soil temperature. This model can distinguish the concentration due to each of these meteorological parameter and to all parameters combined. That is the problem of interrelated parameters can be solved by applying a correlation method from seismic signal processing to soil gas radon data processing. By comparison, the observed radon concentration is different from the calculated radon concentration. This difference can be assumed to be due to other causes other than the meteorological parameter mentioned. The reasons for this difference may be:

- 1) Earthquakes; because the effects of earthquakes are not directly correlatable to any meteorological parameter,
- 2) Time series of radon and the time series of meteorological parameters do not correlated in a fundamentally linear way,
- 3) Parameters other than soil temperature, precipitation, and barometric pressure, such as soil moisture, which influences radon concentration

(see section 1.2), and the level of the water table, which is source of radon,

- 4) The seven-day time interval used to calculate the change of radon concentration for all parameters might be too long. The reason a seven-day time period was used is that a reasonable time period is needed for radon to etch the plastic detector film used in the study,
- 5) Errors caused by manually etching plastic film and by manually counting alpha tracks.

Comparison of the 50-cm and 100-cm depth radon anomalies with the earthquakes shows that there were two radon anomalies which increased and later decreased three weeks before two earthquakes. These relations between radon anomalies and earthquakes fit very well with the dislocation model of Fleisher (see section 4.3). However, there were four other radon anomalies occurred before earthquakes. These anomalies may be from earthquakes that occurred within the error limits of the Fleischer model.

This study showed that radon data collecting using the track-etch method can be used to a certain extent for earthquake prediction, but that it is a time consuming method for data collecting (time integrated sampling). As a result the data collected from this method may be less suitable to predict earthquakes compared to the faster scintillation counter method (continuous sampling).