# Checking the validity of the earthquake prediction method based on over-horizon reception of FM radio waves, the Kushida Method

# Atsumi Kumamoto[1]; Nozomi Ohno[2]; Yoichi Noda[2]; Masashi Kamogawa[3]; Toshiyasu Nagao[2]; Seiya Uyeda[2]

[1] Earthquake Prediction Res. Center, Tokai Univ.

; [2] Earthquake Prediction Res. Center, Tokai Univ.; [3] Dep. of Phys., Tokyo Gakugei Univ.

The Kushida method of short-term earthquake prediction claims that FM radio waves emitted from stations at distances beyond horizon are received before earthquakes. It was initiated by Y. Kushida and R. Kushida in the mid-1990's. Their experimental prediction information has been circulated for the last eight years, but only to the limited numbers of their contributing group. In the summer of 2003, they publicized one of their predictions through media because they felt it obligatory to do so as they judged an M7 class earthquake that might devastate the metropolitan Tokyo area was imminent. What actually happened was an M5.9 event which gave intensity 4 shaking in Tokyo. Although this alarm was a failure for the magnitude error, it raised certain interest both among scientific and general communities. We, having long been paying much attention on the Kushida method since its inception, believe that the method is now at the stage to be cross-checked by other scientists. Actually, such experiments have been started at several universities, including notably Hokkaido University and our group. Some preliminary encouraging results will be presented. It seems also important to check the performance of the method objectively, which has not been made except by Yoshino et al., 1999 who examined the information up to December 1997. In this paper, we checked Kushida experimental prediction information for the period 2000-2003 through examining over 560 news letters against JMA earthquake catalogue. As detailed results to be shown at the presentation indicate, both success rates and alarm rates were found to vary with adopted criteria and time. Generally they range in average around 20-40 %. These rates may be not high enough for practical predictions. But considering that a such success is rare so far, it seems a significant accomplishment. Moreover, it has been shown that even in the case of many failed predictions, apparently significant signals were detected and the failure was caused by misinterpretation. We consider, in conclusion, that this method amply justifies further investigation.