S110-P004 **Room: Poster Session Hall** **Time: May 16**

Aftershock relaxation: Relatively recent and large earthquakes in Japan and the 2004 Northern Sumatra earthquake

Kazuyoshi Nanjo[1]; Bogdan Enescu[2]; Takaki Iwata[1]; Yosihiko Ogata[3]

[1] ISM; [2] RCEP, DPRI, Kyoto Univ.; [3] Inst. Stats. Math.

The decay of aftershock activity has been often discussed based on the Omori-Utsu's law (the modified Omori's law) that provides an appropriate representation of the occurrence rate r(t) of aftershocks with magnitudes larger than m in the form $r(t) = (1/s)(1+t/c)^{(-p)}$, where t is time since a main shock, s and c are characteristic times, and p is a parameter. Extending this approach we derive three possible hypotheses for the relation among s, c, and the lower cutoff magnitude m: (1) c is a constant independent of m and s scales with m, (2) c scales with m and s is a constant independent of m, and (3) both s and c scale with m. The hypotheses are tested by using the aftershocks of six relatively recent and large earthquakes that occurred in Japanese and Sumatra regions. Using the Gutenberg-Richter frequency-magnitude relation, we propose a criterion to find the magnitude above which the aftershocks can be interpreted to be completely detected. We apply this criterion to aftershocks in several early periods of a sequence and use aftershocks with magnitudes above it. Using Akaike Information Criterion, we do a statistical analysis called point process modeling to find the best form for individual sequences. Our analyses show that the second hypothesis is in best agreement with the observational data. The scaling of c with m and a constant s value are good approximations to describe the entire aftershock sequences, for different cutoff magnitudes, from a state defined immediately after the main shock.