AOB Seminar

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講演題目&要旨：

Learning from Outliers

Seismologists study every earthquake and try to extract source parameters. These studies form the basis of kinematic seismology, and provide key information on the general characteristics of earthquakes. The results are often presented as scaling relations between different source parameters.　However these scaling relations give only the general, or average, characteristics of earthquakes, and we often experience significant outliers.　Examples are the 2004 Sumatra earthquake (Mw=9.1), the 1992 Nicaragua tsunami earthquake (Mw=7.7), and the 2011 Tohoku earthquake (Mw=9.0). These outliers are often most damaging and we need to understand why they do not follow the general rule. The 2004 Sumatra and the 1992 Nicaragua earthquakes ruptured over a large distance by successively triggering many asperities. Triggering is a stochastic process that is controlled by many factors and can be predicted only statistically.　Thus, a simple general rule does not work. The 2011 Tohoku earthquake had unusually large slip and stress drop near the trench, and our knowledge about the properties of sediments is still very limited. Other examples of outliers may be the large long-period ground motions that occurred in the Osaka basin during the 2011 Tohoku earthquake and in Kathmandu during the 2015 Nepal earthquake. For comprehensive understanding of seismic hazard, it is important to understand why outliers occur.　We will summarize outliers and discuss why they occur in light of recent studies.