

AOB Seminar

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講演題目: Super-shear rupture propagation in a deep earthquake

The results of our recent studies on the 1994 Bolivia ($M_w=8.2$), 2013 Sea of Okhotsk ($M_w=9.3$), and its $M_w 6.7$ aftershock will be summarized with a special emphasis on the evidence for super-shear rupture propagation during the $M_w=6.7$ earthquake. A super-shear rupture propagation during the $M_w 6.7$ deep earthquake has been recently reported by Zhan et al. (2014). The result suggests that it ruptured downward along a steeply dipping fault plane at an average speed of 8 km/s, about $\sqrt{2}$ times the shear wave speed. Together with the highly dissipative 1994 Bolivia earthquake (radiation efficiency < 0.036), the two events represent two end members of deep earthquakes in terms of energy partitioning. The result for the $M_w=6.7$ event heavily depends on the difference in the pulse width between up-going and down-going rays. Unfortunately, the data set for up-going-rays was very limited. Recently, the Kamchatka Seismological Observatory kindly provided us with a spectacular data set for up-going rays recorded at several broadband stations of their network. A detailed analysis of these seismograms confirmed the conclusion obtained by Zhan et al. (2013)