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Earthquakes along a Subduction Zone and Their Relation to the Interseismic Coupling

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Understanding the behavior of faults involves the physical behavior of rupture involves observations at very short time scale of earthquake duration and much longer time scale related to the seismic cycle. In this presentation, I would like to point out that in order to understand the behavior of faults, we need to make observations at various time scales. By modeling the interseismic locking and comparing them with earthquake source models significantly improves our understanding of seismicity and earthquakes. Ultimately, this information can be utilized to understand the frictional behavior of fault zones. I will show the interseismic locking and the earthquakes of 2004-2007 from the Sumatra subduction zone. I will also comment on the patchiness of the moment-rate functions of most large earthquakes along subduction zone. This patchiness is a proxy for stress heterogeneity or variation of frictional behavior along a fault.