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Rate and State Seismicity Simulations for Large Earthquake Cycles in Western Taiwan

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The stress state variation during the fault rupturing is the key issue for the earthquake hazard. However, the modern seismic catalogs exist the huge gap of large earthquake recurrence records. To understand the occurrence, the probabilities and the dynamic processing of large earthquakes, we employed the multi-cycle earthquake simulator, RSQSim, to exam the fundamental aspects of seismicity distribution in spatial and time in western Taiwan. This 3D, boundary element software assembles the Rate and State Friction law (RSF) and initial stress state to simulate the earthquakes distributions in completely, complex seismogenic system. The heterogeneous initial stresses and recurrence seismic events would be estimated in the long sequences. In this research, we focus on the similarity comparison to the CWB earthquake catalog and Taiwan Earthquake Model (TEM) for the RSQSim simulations. Additionally, this information provides the near optimal nucleation locations and seismic events propagation at the stress evolution in Taiwan faulting systems. Through this process, we would like to examine the recurrence time of the significant earthquakes in western Taiwan. RSQsim results include the comprehensive large events in temporal series to understand the key discrepancy between models and simulators, which will bring the mutual input to TEM for update discussion on slip rate, stress accumulation, and fault system. These modifications provide the better understanding of faults slip and stress state evolution to support the fundamental aspects of earthquake cycles.