Virtual ChuanDian–A Parallel Numerical Modeling of Sichuan-Yunnan Regional Strong Earthquake Activities: Model Construction and Parallel Simulation

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Reasonable use of mathematical modeling and numerical simulation of regional earthquake activities has attracted more and more attentions in realistic seismicity studies in recent years. The inherent nature of their attendant multi-scale properties, from either the temporal or the spatial direction, necessitates the use of the cutting-edge massive parallel data processing techniques. Our study here is focused on the model construction and numerical simulation of the regional stress evolution after large earthquake sequences along the fault zones in Sichuan and Yunnan areas, using large-scale parallel finite element approximations with tens (25) of millions of unstructured meshes on the distributed systems. The objective of our study is to provide a state-of-the-art model and a large-scale numerical simulation platform, on which estimation of the risk of large earthquake triggering sequences can be carried out in a middle or long-term time scale with realistic data and constrains inputted from field observation and geological survey.