

**Basic study towards earthquake disaster estimation of cities by  
3D wave propagation analysis and structural response analysis**

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Reliable earthquake disaster estimation of cities is needed for making effective mitigation measures under tight budget constraints. Combining high fidelity numerical analysis programs that analyze each phase of earthquake disaster may be a way to improve current earthquake disaster estimation methods. We use 3D wave propagation analysis methods and structural response analysis methods for analyzing response of structures reflecting 3D soil structures. Both high resolution wave propagation analysis and structural response analysis of large number of structures that make up a city are large scale computation problems; we use parallel computation methods on high performance computers for finishing computation in reasonable time. We develop ways to pass the computed wave at surface from the wave propagation program to structural response program to enable such analysis, and demonstrate its usage on K computer at RIKEN.