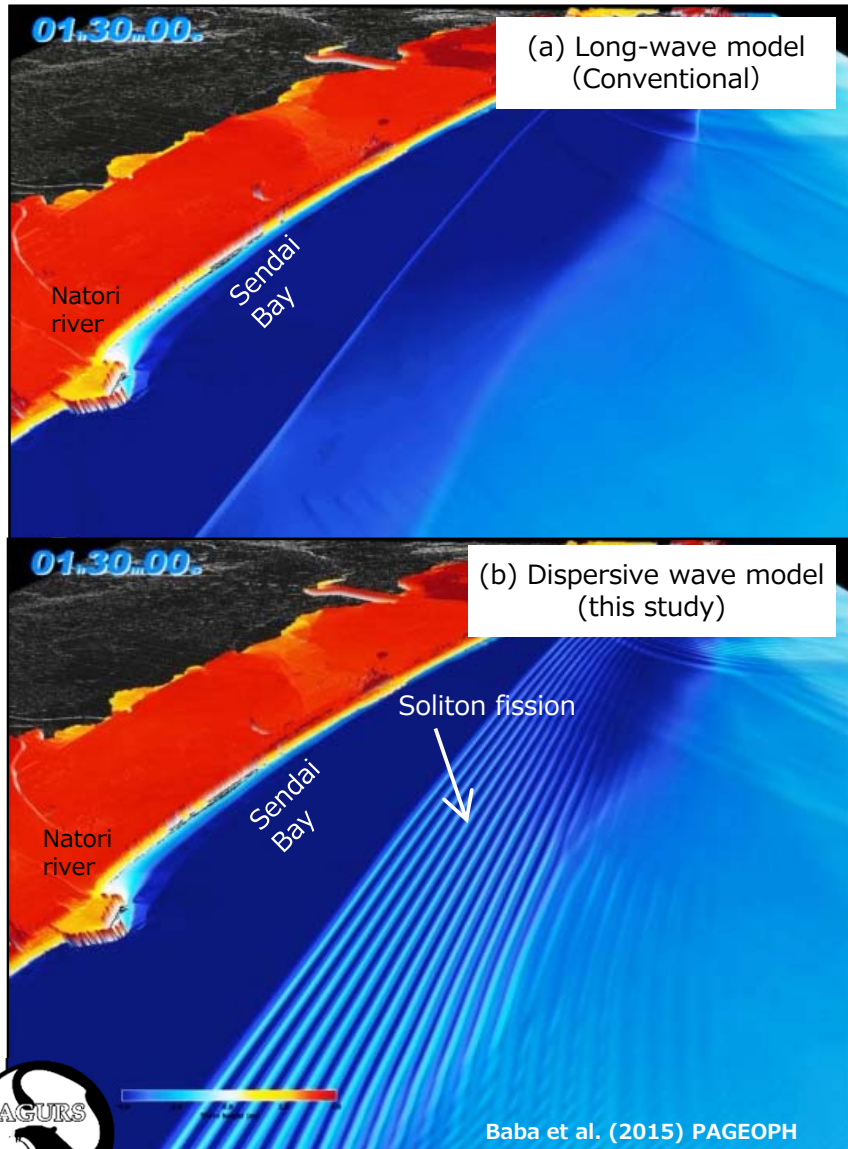




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# Accurate and High-speed Tsunami Simulation

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Sea-surface fluctuations near the Sendai coast 90 minutes after the earthquake occurred simulated with (a) the nonlinear long-wave equations and (b) the nonlinear dispersive wave equations.

A great subduction zone earthquake could occur along the Nankai trough accompanied by a great tsunami. It may cause a severe disaster such as that we have been experienced in the 2011 Tohoku earthquake. In order to mitigate the tsunami damage, physical behavior of tsunami should be investigated by a broad field of study.

We develop an accurate and high-speed tsunami simulation software called JAGURS which was optimized very much on high-performance parallel computers such as the K computer and the Earth Simulator in Japan. JAGURS is not only high-speed, but also more accurate than the conventional tsunami software. The figures are sea-surface fluctuations simulated with (a) the long-wave equations and (b) the dispersive wave equations near the Sendai coast 90 minutes after the 2011 Tohoku earthquake. We can see dispersive wave trains (soliton fissions) in (b) but not in (a). Actually, in the area, the soliton fissions were recorded from a helicopter. We also investigate a real time tsunami prediction system by a combination of high-speed calculation and cutting-edge seafloor tsunami observation networks.

Keywords: Tsunami, Numerical simulation, Nankai subduction zone

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