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## Experimental Studies on the Hydroelastic Response due to Springing Using a Flexible Mega-Container Ship Model (1st Report)

[Ryuji Miyake](#), [Toshiyuki Matsumoto](#), [Tingyao Zhu](#) and [Norikazu Abe](#)

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**Summary:** Experimental studies on the hydroelastic response of mega-container ships have been conducted using a modified Wigley model with the elastic backbone having the rigidity equal to that of a 12,000 TEU container ship in regular waves in order to investigate the influence of whipping and springing on the hull structural strength of mega-container ships. In the tank tests, ship motions, hydrodynamic pressures and accelerations were measured. The springing of 1st harmonic resonance due to coincidence of the encountered wave period and the natural period of 2-noded hull vibration occurred in shorter wavelength. During the tank tests, the springing of superharmonic (n-th harmonic) resonance due to nonlinear higher hydrodynamic forces also occurred, although the model is simple mathematical hull forms without bulbous bow. In addition to the tank tests, a validity of 3D Rankine source method to analyze the springing was investigated and discussed by comparing the numerical results with the experimental ones. It was confirmed that the 3D Rankine source method can estimate the springing of the 1st harmonic resonance with good accuracy.

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