

## Computational Fluid Dynamics Simulation of Floating Body Motion Interacting with Focused Waves

**Authors :** Seul-Ki Park, Jong-Chun Park, Gyu-Mok Jeon, Dae-Kyung Ock, Seung-Gyu Jeong

**Abstract :** Rogue waves cause frequent accidents of ships and offshore structures, which can result in severe damage to the structures. The Rogue waves, which are also known as big waves, freak waves, extreme waves, monster waves, focused waves, giant waves and abnormal waves, are unexpected and suddenly appearing, and can have a breaking force to destroy the structure even though modern structures are designed to tolerate a breaking wave. In the present study, a series of focused waves are numerically reproduced by concentrating nonlinear multi-directional waves into a target point using a commercial CFD software, Star-CCM+. A flow analysis for investigating the physical characteristics of the focused waves is performed using the Star-CCM+, while it has several difficulties to examine the inner properties of the waves in existing potential theory and experiments. Additionally, the 6-DOF (Degree of Freedom) motion of a floating body interacting with the focused waves are simulated, and the dynamic response of the body are discussed.

**Keywords :** multidirectional waves, focused waves, rogue waves, wave-structure interaction, numerical wave tank, computational fluid dynamics

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