

**PROCEEDINGS**

## Underwater Explosion Cavitation Characteristics of Inclined Wall Near Free Surface

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### ABSTRACT

The shock wave and cavitation reloading caused by underwater explosion (UNDEX) could threaten the survivability of naval ships seriously. In this talk, we introduce the local discontinuous Galerkin (LDG) method [1] to solve the wave equation to track the propagation and reflection of the UNDEX shock wave. And the pressure cutoff model is adopted to simulate the cavitation effect caused by the reflection of the shock wave. The present LDG model can accurately calculate the UNDEX shock wave and cavitation loading. The present model is validated by comparing with the total formulation calculated by the ABAQUS software. Using this model, the cavitation characteristics of inclined wall near free surface are investigated. And the action of the complex fluid field boundary on the explosion loading and cavitation characteristics are analyzed.

### KEYWORDS

Underwater explosion; local discontinuous Galerkin; shock wave; cavitation effects

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**Conflicts of Interest:** The authors declare that they have no conflicts of interest to report regarding the present study.

### References

1. Wu, W. B., Zhang, A. -M., Liu, Y. L., Wang, S. -P. (2019) Local discontinuous Galerkin method for far-field underwater explosion shock wave and cavitation. *Applied Ocean Research* 87(24), 102-110.



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