

Structural integrity under extreme loads

Topic: High-fidelity models of blast waves

TITLE: Numerical models for underwater explosions (UNDEX)

RESEARCH BACKGROUND:

Many studies have been performed for air-blast, while there is a lack of readily available numerical frameworks for underwater explosions due to the increased complexity posed by the interaction between water, shockwaves and air bubbles. The need for such tools is crucial for the assessment of naval structures.

RESEARCH ACTIVITIES:

1. Literature review of underwater explosion (UNDEX).
2. Modelling of simple UNDEX case studies.
 - Effect of different soils (clay, sandy, rigid) and of the free surface.
 - Effect of different explosive charges (conventional, aluminized).
3. Numerical structural assessment of representative naval structures against UNDEX.

METHODOLOGY: Numerical

DURATION: 9 months

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