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Title: Physics-Based Modelling of Ship Replenishment at Sea Using Distributed Simulation

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Abstract: Replenishment at sea is essential for sustainment of naval operations away from home ports. This paper describes physics-based simulation of the transfer of solid payloads between two ships. For a given operational scenario, the simulation can determine whether events such as breakage of replenishment gear or immersion of payload in the ocean will occur. The simulation includes detailed modelling of the replenishment gear and ship motions. Distributed simulation using the High Level Architecture facilitates time management and data exchange among simulation components.

Keywords: Distributed simulation, replenishment, seakeeping, ship motions