Ice Load Calculation of Vessel sailing in Ice Flows

by Using DEM Method

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Abstract

Sailing in ice-covered water require good engineering to ensure the safety of personnel and the environment. In polar region, load of sea ice is the main factor hindering the operations. It affects shipping , and oil and gas exploration and development. This paper reports on the computational fluid dynamics(CFD) calculation results of ice load calculation of a module carrier sailing in ice flows by using 3-D discrete element method(DEM). A comparison between CFD calculation results and HSVA model test results is carried out to verify the accuracy of CFD calculation. The purport of this paper is to find another way to evaluate the capacity of vessel sailing in ice flows, not only wait for model test results nor according to the Finnish-Swedish Ice class rules.

Keywords: Sea ice; DEM; Impact; Model test; Ice class