ONLINE ISSN : 1881-1760
PRINT ISSN : 1880-3717

Journal of the Japan Society of Naval Architects and Ocean Engineers
Vol. 8 (2008) pp.99-106

[PDF (1737K)] [References]

Development of motion simulator of ice pieces around ship hull for evaluation of icebreaker performance

Akihisa Konno, Takashi Mizuki, Keisuke Yamamoto, Naoki Yasuki, Daisuke Wako, Tadanori Takimoto, Shigeo Kanada, Haruhito Shimoda and Koh Izumiyama

(Accepted July 7, 2008)

Summary: To estimate the performance and risk of an icebreaker, we are developing a numerical simulator for icebreaker performance under conditions that many ice pieces colliding and scraping against the icebreaker hull. Open Dynamics Engine (ODE) is incorporated into our simulator to allow the use of physically based modeling to illustrate these mutual interactions. We carry out pre-sawn ice test in the ice model basin of National Maritime Research Institute, and compare its result with simulation results to verify the numerical method. In the simulation,virtual fluid force acts on each ice piece to reproduce ship advance. Buoyancy with static pressure is also considered. Coefficient of restitution is set to zero and friction coefficient between ice pieces is set to 1:35. Ice motion in the simulation generally agrees with the experimental results. Appropriate relaxation parameter for virtual fluid force is investigated.

106 .