

Accepted Manuscript

A simulation study on the interaction between sloping marine structure and level ice based on cohesive element model

Feng Wang, Zao-Jian Zou, Li Zhou, Yi-Zhou Ren, Shu-Qi Wang



PII: S0165-232X(16)30204-X
DOI: <https://doi.org/10.1016/j.coldregions.2018.01.022>
Reference: COLTEC 2528
To appear in: *Cold Regions Science and Technology*
Received date: 11 September 2016
Revised date: 21 January 2018
Accepted date: 29 January 2018

Please cite this article as: Feng Wang, Zao-Jian Zou, Li Zhou, Yi-Zhou Ren, Shu-Qi Wang , A simulation study on the interaction between sloping marine structure and level ice based on cohesive element model. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Coltec(2017), <https://doi.org/10.1016/j.coldregions.2018.01.022>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A simulation study on the interaction between sloping marine structure and level ice based on cohesive element model

Feng Wang¹, Zao-Jian Zou^{1,2}, Li Zhou³, Yi-Zhou Ren⁴, Shu-Qi Wang³

1. School of Naval Architecture, Ocean and Civil Engineering, Shanghai Jiao Tong University, Shanghai 200240, China;
2. Collaborative Innovation Center for Advanced Ship and Deep-Sea Exploration, Shanghai 200240, China;
3. School of Naval Architecture and Ocean Engineering, Jiangsu University of Science and Technology, Zhenjiang 212003, China;
4. Marine Design & Research Institute of China, Shanghai 200011, China

Abstract: The interaction between sloping marine structure and level ice is a complex process, which contains local crushing and flexural failure. The ice fragments fallen from ice sheet will continuously experience rotation, sliding and accumulation processes. These processes interfere with each other and give rise to difficulty to determine accurately the ice loads on structure. The issue is solved by using cohesive element model (CEM) in this paper. In the condition of a cone icebreaking against level ice, the elastoplastic linear softening constitutive model is introduced to the regular tri-prism bulk elements to present the microscopic crushing of ice sheet, while the bending failure of ice sheet is caused by the failure of cohesive elements. The proposed models are incorporated into the LS-DYNA finite element code. The mesh dependency study and a series of parametric analysis on the main parameters of models are conducted. The numerical results are compared with available model test data in literature, and good agreements are achieved. Then a series of simulations in terms of invasion velocity, cone angle and cone waterline diameter are performed. Effects of these parameters on the ice loads and contributions of breaking module are discussed.

Keywords: structure-ice interaction; elastoplastic constitutive model; cohesive element model; parametric analysis; ice loads

* Corresponding author. Tel.: +86 21 34204255
E-mail address: zjzou@sjtu.edu.cn

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات