



Abstract View

[Volume 27, Issue 9 \(September 1997\)](#)

Journal of Physical Oceanography

Article: pp. 1976–1996 | [Full Text](#) | [PDF \(439K\)](#)

Air–Ice–Ocean Momentum Exchange. Part II: Ice Drift

Will Perrie and Yongcun Hu

Ocean Sciences Division, Fisheries and Oceans Canada, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

(Manuscript received October 18, 1995, in final form February 25, 1997)

DOI: 10.1175/1520-0485(1997)027<1976:AIOMEP>2.0.CO;2

ABSTRACT

A model was constructed to estimate ice floe trajectories. The model considers the balance of atmosphere and ocean drag forces on ice floes, including skin and body drag forces from wind, waves, and currents. Discussion of air–ice and water–ice skin stresses, water–ice form stress, and wave radiation stress is presented. Estimates are presented for the ice drift in a variety of hypothetical situations: (i) as a function of ice floe diameter, thickness, and concentration; (ii) in “wave” and “no wave” situations; and (iii) in constant wind forcing and time-varying wind forcing situations. The model is shown to be consistent with wave and ice observations collected during the Labrador Ice Margin Experiment 1987 on the Grand Banks during relatively high wind situations. Combining this model with the wave-scattering model of Part I allows estimation of 1) the effect of wave scattering attenuation on ice floe trajectories and the ice edge and 2) the effect of ice floe drift on the wave spectra. Thus, an enhanced modeling of wave and ice dynamics is achieved.

Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

Search CrossRef for:

- [Articles Citing This Article](#)

Search Google Scholar for:

- [Will Perrie](#)
- [Yongcun Hu](#)



amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.