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On the Geometrical Characteristics of the Breaking Bow Waves[1] M. SHAKERI, M. TAVAKOLINEJAD, J.R. WALTERS, J.H. DUNCAN, University of Maryland — Simulated breaking bow waves were generated using a 2D+T wave maker in a 14.8-m-long tank with a water depth of 1.83 m. The wave maker motion simulates the passage of a ship model with a length, beam, and draft of 21.03, 2.82, and .91 m, respectively. The profile histories of the breaking bow waves were measured with an LIF technique. Geometric characteristics the water surface/hull contact line, the wave crest, and the plunging jet were measured as a function of the equivalent forward speed of the ship model. It was found that the maximum height of the free surface contact line and the main wave crest increases with equivalent 3D ship model speed. The main wave crest moves at a speed of 45% of the speed of the equivalent 3D ship model. The horizontal trajectories of the point of the maximum height of the wave crest are converted into an equivalent 3D ship model system where they are straight lines and make an almost constant angle with the ship centerline. The jet created by the breaking wave impacts the front face of the wave at a speed of about 50% of the speed of the equivalent 3D ship model.

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