

Abstract Submitted
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Do Waveless Ships Exist? PHILIPPE TRINH, JON CHAPMAN, Oxford University, JEAN-MARC VANDEN-BROECK, University College London — Consider two-dimensional ideal and low-speed flow past a ship modeled as a semi-infinite body with constant draft. In the 1970s, on the basis of numerical evidence, it was conjectured that ships with a single front face will always generate a wake. Later in the 1980s, seemingly waveless ships with bulbous profiles were discovered. And finally, conflicting evidence in the 1990s suggested that the waves were in fact present, but simply too small to be recognized. In this talk, we will show how recent techniques in exponential asymptotics can be used in order to study the ship-wave problem. In particular, we will show how the formation of waves near a ship are a necessary consequence of singularities in ship's geometry, such as those corresponding to sharp corners or stagnation points. Finally, we will show how the theory can be applied in order to prove that certain ship profiles will or will not produce a wake in the low-speed limit.

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