Theoretical and Experimental Investigation of Ship Wakes

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In this study, we investigate the formation and characteristics of ship wakes. The longstanding explanation of a constant wake angle, independent of any ship parameters, has been questioned recently, most famously by Marc Rabaud and Frederic Moisy, who observed wake angles much smaller than the Kelvin one. Through different experiments covering a wide range of important parameters, we obtained both the classical and the narrow wake angle regimes. Our findings reveal that our novel theory yields better agreement with experimental data, especially in the range of Froude numbers (2.6- 4.4). Our model converges to the Kelvin and Rabaud-Moisy ones for lower and higher Froude numbers respectively, proving that our theory is a more general case of the previously established models in the field.

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