

IOWA STATE UNIVERSITY

Center for Multiphase Flow Research and Education

On the Break-up of a Turbulent Liquid Wall Sheet

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Abstract

A wide range of applications involve the break-up of liquid jets into spray. For the Navy, the thin fluid sheet separating off the bow of a ship, and how it breaks into spray droplets is of particular interest. While circular liquid jets have been studied extensively, geometrical and scale differences make the break-up of a liquid wall sheet different from both circular free and wall jets, although the sheet break-up mechanisms can be similar. Currently the direct simulation of these processes is impractical due to the large range of scales involved and the requirements on grid resolution and computational time. Because of these limitations, semi-empirical closure models are typically used. This talk will describe results from a set of experiments focused on the break-up of a turbulent liquid wall sheet. The focus of the effort was to investigate physical mechanisms and provide data for assessment of numerical simulations of the bulk properties of the sheet and spray.

Biography

Dr. Thomas Fu is the acting head of the Mission Capable, Persistent and Survivable Naval Platforms Department of the U.S. Office of Naval Research (ONR) overseeing a broad range of science and technology programs focused on naval platforms and undersea weapons, with an annual budget of ~\$450 million per year. He has a BS in engineering from Purdue University; an MS in physical oceanography from the Scripps Institution of Oceanography, University of California, San Diego; and a Ph.D. in mechanical engineering from Johns Hopkins University. Dr. Fu was named 2013 the Asian-American Engineer of the Year by the Chinese Institute of Engineers-USA, and in 2018 a Fellow of the American Society of Mechanical Engineers.



Refreshments will be provided.

This seminar counts towards the ME 600 seminar requirement for Mechanical Engineering graduate students.

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