

Abstract Submitted  
for the DFD05 Meeting of  
The American Physical Society

Sorting Category: 22. (C)

**Simulations of densely-packed cloth motion in water<sup>1</sup>**

DENIZ T. AKCABAY, WILLIAM W. SCHULTZ, DAVID R. DOWLING, University of Michigan — Fluid-structure simulations of densely-packed immersed fabric model the clothes washing process. We have modified the Immersed Boundary Method (Peskin 1977) to handle the known but complex geometry of the washing machine and agitator as well as the unknown cloth structure immersed in the fluid. Extending the technique to three-dimensions has required improved computational efficiency and causes geometric singularities when cloth that is not sufficiently extensible bends in two directions. We present some preliminary comparisons to primarily two-dimensional experiments in the dilute cloth limit. Computational difficulties caused by cloth permeability and bending stiffness will be discussed.

<sup>1</sup>Supported by Whirlpool Corporation.

Prefer Oral Session  
 Prefer Poster Session

William Schultz  
schultz@umich.edu  
University of Michigan

Date submitted: 12 Aug 2005

Electronic form version 1.4