

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Undergraduate Studies on Compressible Flows and Shock Waves**<sup>1</sup> KEITH STEIN, JENNIFER SCHOMMER, BENJAMIN HEPPNER, Bethel University — The Bethel University physics department believes advanced lab projects and undergraduate research experiences are crucial in the development of our students, particularly those that pursue graduate studies in physics, engineering and other applied fields. Open-ended advanced lab projects are key components in several upper level physics courses. Student project work in a specific course is often enhanced by student experiences in other upper level physics courses or other research experiences. For example, projects in *Fluid Mechanics* (PHY420) are often enriched by experiences that students bring from projects in *Optics* (PHY330) and *Computer Methods in Physics* (PHY350). We present examples from recent undergraduate projects on compressible flows and shock waves. Special attention is given to a project involving the design, construction, and initial testing of a small supersonic blowdown tunnel. This facility was initially constructed as part of a project in *Fluid Mechanics* (fall 2010). Subsequent student research projects have included high-speed video shadowgraph imaging (summer 2011) and the development of a MATLAB GUI to allow for side-by-side comparisons between simulation and ongoing experiments with the tunnel (fall 2011).

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Date submitted: 11 Nov 2011

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