

Meeting: 1006, Lubbock, Texas, SS 14A, Special Session on Undergraduate and Graduate Student Research (and Related Poster Session organized by Ali Khoujmane and Mara D. Neusal, Texas Tech)

1006-65-235 **Edward W Swim*** (eswim@math.ttu.edu), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79416, and **Padmanabhan Seshaiyer**. *Consistency and stability of a nonconforming finite element method for fluid-structure interaction.*

We develop a nonconforming finite element methodology using a *three-field* formulation to analyze a fluid-structure interaction problem. The methodology is used to couple a Lagrangian model describing the structure with the arbitrary Lagrangian-Eulerian strategy used to describe the fluid in order to simulate a full unsteady physical phenomenon. Consistency error estimates are obtained which show that the numerical scheme employed yields a first order approximation for the solution to the fluid-structure interaction problem. Finally, we present a discrete energy estimate to demonstrate the stability of the proposed method. (Received February 15, 2005)