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Wayne M. McGee* (wayne.mcgee@ttu.edu), Department of Mathematics & Statistics, MS 1042, Texas Tech University, Lubbock, TX 79409, and **Padmanabhan Seshaiyer**. *Implicit Interfacing in a C^k Least Squares Finite Element Method for a Fluid Structure Interaction Problem.*

Bimedia interactions arise in many applications such as arterial blood flow analysis and micro-air-vehicle design. We develop and implement a least-squares type finite element method, resulting in a variationally consistent formulation, and a fully implicit interfacing method between material subdomains. The method is applied using basis functions which have globally continuous derivatives up to any prescribed order, and hence the approximants exhibit interelement behavior which is consistent with the governing differential equations. We will validate our results with experimental data. (Received September 20, 2007)