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Christopher M Kuster* (cmkuster@ncsu.edu), Department of Mathematics, North Carolina State University, Box 8205, Raleigh, NC 27695. *A fast iterative numerical method for the free boundary Bernoulli problem.*

The numerical solution of the free boundary Bernoulli problem is addressed. An iterative method based on a level-set formulation and boundary element method is proposed. Issues related to the implementation, the accuracy and the generality of the method are discussed. The accuracy and efficiency of the approach is illustrated by numerical results. The method is adapted to solve a two-phase Stefan problem arising in laser welding. (Received September 15, 2006)