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Starting with the derivation of the Navier-Stokes equations for viscous heat-conducting fluids the author proceeds to discuss various forms of these equations, including the special cases of compressible isentropic viscous flow of polytropic gases and viscous incompressible fluid flow. He then discusses the Orr-Sommerfeld theory for the plane Poiseuille flow as well as other basic flow cases, such as steady flow through an arbitrary cylinder, annular flow between concentric cylinders, Benard thermal convection flow, Benard-Marangoni flow induced by tangential gradients of variable surface tension, flow due to a rotating disc, and Rayleigh flow caused by an impulsively started flat...
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- Experimental Study of Cavitation in Laminar Flow  
  *Proceedings of the 10th International Symposium on Cavitation (CAV2018)*
The level set method is based on the concept of implicit surfaces that is described in Chapter II-1. To define an implicit surface, we construct a function, \( F(x,y,z) \), such that when. For our current purpose, we let the level set method define the location of a delamination crack front. The level set field is defined on a surface domain \( \Omega \phi \), which coincides with the plane of the interface. The interface is cracked where \( \phi > 0 \) and intact where \( \phi < 0 \). The crack front location is therefore given by the contour line or level set \( \Gamma \phi \) at \( \phi = 0 \). In the model formulation, the boundary \( \Gamma_u \) between the cracked part and the uncracked part of the computational domain \( \Omega_u \) will play an important role. The great success of level set methods (and other Eulerian methods) can be attributed to the role of curvature in numerical regularization such that the proper vanishing viscosity s Shape modeling with pointsampled geometry. by Mark Pauly, Richard Keiser, Leif P. Kobbelt, Markus Gross - ACM Transactions on Graphics , 2003. By combining unstructured point clouds with the implicit surface definition of the moving least squares approximation, we obtain a hybrid geometry representation that allows us to exploit the advantages of implicit and parametric surface models. Based on this representation we introduce a shape modeling system that enables the designer to perform large constrained deformations as well as boolean operations on arbitrarily shaped objects. Scope, Aims, and Audiences This book, Level Set Methods and Dynamic Implicit Surfaces is designed to serve two purposes: Parts I and II introduce the reader to implicit surfaces and level set methods. We have used these chapters to teach introductory courses on the material to students with little more than a fundamental math background. No prior knowledge of partial di?erential equations or numerical analysis is required. Scope, Aims, and Audiences This book, Level Set Methods and Dynamic Implicit Surfaces is designed to serve two purposes: Parts I and II introduce the reader to implicit surfaces and level set methods. We have used these chapters to teach introductory courses on the material to students with little more than a fundamental math background.