

CFD METHODS DERIVED FROM SIMPLIFIED VARIATIONAL PRINCIPLES

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ABSTRACT

In previous papers [1-4] we have described how by minimizing the fluid action numerically one can obtain a solution of the fluid steady state equations. The action which was used was the four function action of Seliger & Whitham [5]. In a recent paper [6] we describe how one can improve upon previous art by reducing the number of variables in the action. Three independent functions variational formalism for stationary and non-stationary barotropic flows is introduced. This is less than the four variables which appear in the standard equations of fluid dynamics which are the velocity field and the density . In this paper we will discuss some issues related to the usage of the new action principles as basis for CFD algorithms.

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