Free Surface Flow Modeling at HPCC

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High Performance Computing Center of Shiraz University provides software and hardware facilities for solving involved and complicated Fluid and Computational Mechanics problems. This center has brought together cluster of workstations working in parallel which are designed and manufactured by the stuff members of the center. In this lecture, in addition to introducing this center, an ongoing research project about free surface flow modeling is presented. Free surface flows are important both in applications and numerical modeling of two-phase flows. In the present study VOF method is used along with Lagrangian propagation algorithm for the interface. In the context of Generalized Curvilinear Coordinates a numerical algorithm and a code are developed to handle various flow situations.

Unsteady formulation of the problem, provides the ability of solving steady as well as unsteady problems. After solving single flows problems to validate the code, some applications are presented which are of more practical interest. Among these examples are dam-breaking problems and 2-D hovercraft flow modeling.