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Abstracts of Short Communications and Posters

Section:

15. Numerical Analysis and Scientific Computing

1991 MS Classification: 65xx,76 -xx, 76 M20
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Modeling of Fluid Flows with Strong Non-Linearity
Among the varieties of methods applied in modeling of fluids the Semi-Implicit Finite Differences Alternative Directions (Splitting Operators) techniques ocupies special place. It was created in 1978 in Moscow for numerical solving of the Navier-Stockes equations. The method allows to reduce a system of 5 or more PDE (usually coupled) for the velocity, density (pressure), temperature and species concentrations to a large system of algebraic equations, which is solved by forward-backward matrix procedure. The procedure is quoite difficult and computer time consuming. As compensation to this obstacles one gets detailed picture of the flow behavior, namely the velocity, the temperature, the heat fluxes, other special profiles and time-dependent characteristics. Examples will be given for solving low Mach flows with high temperature gradients.