

Lock Method for the Equations of the Lagrangian Gas Dynamics in Mixed Cells, Based on the Equity of the Components' Velocities.

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One of the most complicated problems of the Lagrangian-Eulerian methods (ALE) is the approximation of the equations of the Lagrangian gas dynamics for the case of multi-component environment because of the occurrence of the so-called mixed cells with two or more components. The mixed cells may occur in the calculations due to two reasons. First, when the interface moves along the Eulerian grid, and, second, if the problem has two zones of different materials mixing. The efficiency and the accuracy of both the Lagrangian gas dynamics individually, and the ALE method as a whole, where the Lagrangian gas dynamics is a constituent, depend on the solution of the specified problem.

This paper proposes a novel calculation method for thermo-dynamic state of mixed cells (lock method), based on the leveling of the components' mass velocities after passing of small perturbations through the heterogeneous mixture.

Test problems are used for the study of the precision of the results obtained under this method, supplemented with the algorithm of iterationless leveling of the components' pressures.