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# Cell-centered Lagrangian scheme for multiphase flows with equal pressure assumption

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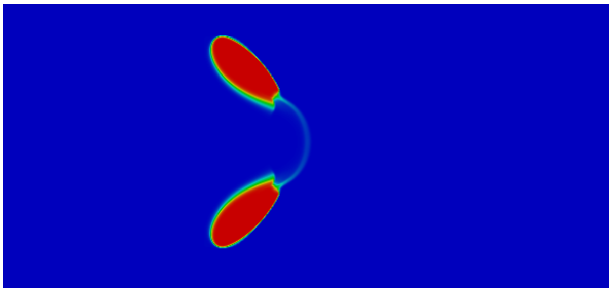
An extension of the cell-centered monophase Lagrangian scheme EUCCLHYD [1] is presented for a multiphase hydrodynamics model with equal pressure assumption [2]. It is well known that such a model has different solutions around discontinuities due to non-conservative products. From a physical point of view, the solutions can be selected according to how each phase dissipates entropy. Thus, the derivation of the scheme is made general enough to enable an arbitrary distribution on each phase of the global entropy dissipation given by the underlying EUCCLHYD scheme. Furthermore, the scheme is conservative in mass, momentum and total energy. The scheme is confronted with different 1 or 2-dimensional test cases where phases have highly different equations of state. These test cases attest the robustness of the scheme and demonstrate that pressures are kept equal up to the scheme order. In addition, the pressures can be easily relaxed if one needs to enforce an exact equality.



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