

On Finite Volume Methods for Coupled Flows on Delaunay Meshes and the Preservation of the Local Maximum Principle

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We present new approaches for the discretization of coupled flow processes, in which convection-diffusion equations are coupled with the incompressible Navier-Stokes equations. The discretization aims at the discrete preservation of the local maximum principle in the convection-diffusion processes and it is based on the classical vertex-based finite volume method on boundary-conforming Delaunay meshes. The incompressible Navier-Stokes equations are discretized by a dual-grid approach, which is an extension of the classical MAC scheme to unstructured simplex meshes.