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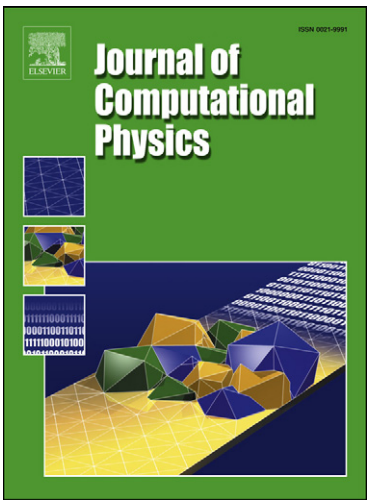

On enforcing maximum principles and achieving element-wise species balance for advection–diffusion–reaction equations under the finite element method

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On enforcing maximum principles and achieving element-wise species balance for advection-diffusion-reaction equations under the finite element method

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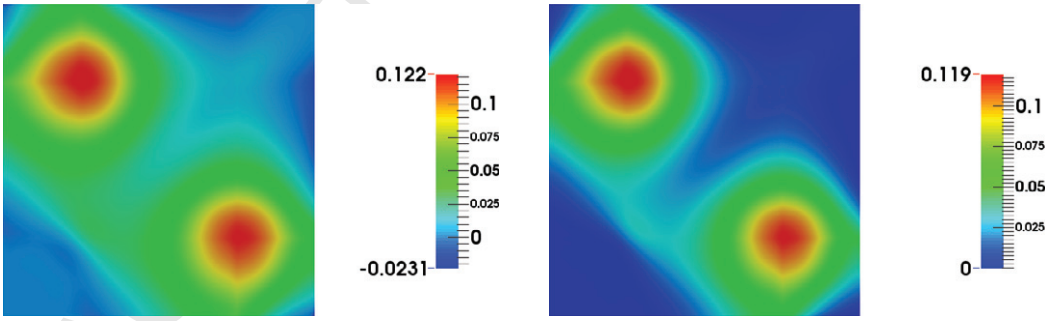

These figures show the fate of the product in a transient transport-controlled bimolecular reaction under vortex-stirred mixing. The left figure is obtained using a popular numerical formulation, which violates the non-negative constraint. The right figure is based on the proposed computational framework. These figures clearly illustrate the main contribution of this paper: *The proposed computational framework produces physically meaningful results for advective-diffusive-reactive systems, which is not the case with many popular formulations.*

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