

Split-explicit time integration methods for finite element discretizations

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There is a new interest in finite element methods for solving the equations in numerical weather forecasting. In contrast to finite difference and finite volume methods explicit time integration methods are hampered by non-diagonal mass matrices in front of the time derivatives. We will compare different mixed finite and discontinuous Galerkin methods for the two-dimensional linear Boussinesq approximation in the context of split-explicit time integration schemes. Especially different lumping procedures are investigated which replaces non-diagonal mass matrices by simple diagonal block-diagonal matrices.