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**Compatible algorithms for coupled flow and transport.** (English) Zbl 1067.76565  
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Summary: The issue of mass conservation in numerical methods for flow coupled to transport has been debated in the literature for the past several years. In this paper, we address the loss of accuracy and/or loss of global conservation which can occur when flow and transport schemes are not compatible. We give a definition of compatible flow and transport schemes, with emphasis on two popular types of transport algorithms, the streamline diffusion method and discontinuous Galerkin methods. We then discuss several different approaches for flow which are compatible with these transport algorithms. Finally, we give some numerical examples which demonstrate the possible effects of incompatibility between schemes.

**MSC:**

**76M10** Finite element methods applied to problems in fluid mechanics  
**76R99** Diffusion and convection

Cited in **118** Documents

**Keywords:**

Mass conservation; Streamline diffusion method; Discontinuous Galerkin methods

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