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Stabilization and shock-capturing parameters in SUPG formulation of compressible flows.

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Summary: The streamline-upwind/Petrov-Galerkin (SUPG) formulation is one of the most widely used stabilized methods in finite element computation of compressible flows. It includes a stabilization parameter that is known as τ . Typically the SUPG formulation is used in combination with a shock-capturing term that provides additional stability near the shock fronts. The definition of the shock-capturing term includes a shock-capturing parameter. In this paper, we describe, for the finite element formulation of compressible flows based on conservation variables, new ways for determining the τ and the shock-capturing parameter. The new definitions for the shock-capturing parameter are much simpler than the ones based on the entropy variables, involve less operations in calculating the shock-capturing term, and yield better shock quality in test computations.

MSC:

76M10 Finite element methods applied to problems in fluid mechanics

76N15 Gas dynamics (general theory)

76L05 Shock waves and blast waves in fluid mechanics

Cited in **1** Review
Cited in **95** Documents

Keywords:

[finite element formulation](#); [oblique shock](#); [reflected shock](#)

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