

1154-65-2140

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*Primal-Dual Weak Galerkin Finite Element Methods.*

Weak Galerkin (WG) finite element method is a numerical technique for PDEs where the differential operators in the weak form are reconstructed by using a framework that mimics the theory of distributions for piecewise polynomials. The usual regularity of the approximating functions is compensated by carefully-designed stabilizers. In this talk, the speaker will discuss a primal-dual weak Galerkin (PD-WG) approach for some model PDE problems for which the usual numerical methods are difficult to apply. The idea of PD-WG will be first illustrated using linear transport equations, and will then be applied to general div-curl systems. (Received September 17, 2019)