

Basics of 3D DDFV schemes, and 2D CVFE scheme

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Abstract

I will detail the construction of two well-known 3D DDFV schemes (CeVeFE-DDFV and CeVe-DDFV) with their variants, with a focus on their core features that are the discrete duality, the strong consistency of the gradient, and the weak consistency of the divergence. I will highlight the fact that the construction of the 3D CeVe-DDFV is based upon the 2D gradient reconstruction of CFVE (co-volume, lumped FE) schemes. The CVFE (Control Volume Finite Element) scheme actually shares with the DDFV schemes the aforementioned core properties, including the Discrete Duality.