

Mimetic Finite Difference Operators & High Order Numerical Quadratures

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Mimetic finite difference operators, D and G are discrete analogs of their continuous divergence and gradient operators. These discrete operators satisfy in the discrete sense the same properties that their continuum counterpart ones do. In particular, they satisfy a discrete extended Gauss divergence theorem. We present high order numerical quadrature, associated with the fourth and sixth order mimetic finite difference operators and show that they satisfy the divergence theorem. In addition, we present the extension to curvilinear coordinates. Some examples to illustrate our results are presented that clearly confirm our theoretical results.