Gaining insight of accuracy enhancement through divided difference estimates

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The ability to enhance accuracy through post-processing is an attractive feature in finite element methods. One such technique, the Smoothness-Increasing Accuracy-Conserving (SIAC) filter is designed to increase the smoothness and improve the convergence rate of a discontinuous Galerkin solution from p+1 to 2p+1 through post-processing. However, this relies on appropriate divided difference estimates. In this talk, we explore the importance of the underlying divided difference estimates for both linear and nonlinear hyperbolic equations and how these estimates can enlighten our knowledge of the filter scaling to aid in improving theoretical estimates as well as improving the computational viability for multi-dimensional calculations.