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One Possible Pitfall with Current Practice in Grid-Convergence

RYAN Z. DAVIS, RICHARD SKIFTON, AKIRA TOKUHIRO, University of Idaho

— It is claimed that a possible flaw could exist in common-practice grid convergence studies. The problem comes when a field point value is observed near a discontinuity or a strong gradient and used to calculate the order-of-convergence, or even confirm grid convergence. A discrete domain can produce a “smoothing” effect in the vicinity of strong gradients. When field point values are observed near these areas their values can change dramatically, or not at all, depending on where the discrete points lie. This can lead the user to believe grid convergence has been achieved when in reality it has not. A submerged jet is used as a case study to demonstrate how the order-of-convergence can be affected when observing field point values near and far from strong gradients.

Ryan Z. Davis
University of Idaho

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