

Abstract Submitted
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Characterization of discrete commutative filters ANDREAS
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University of Colorado at Boulder — Previous work by the authors (J. Comp. Phys.,
187: 197-211, 2003) derived and analyzed discrete commutative filters. On uniform
unbounded grids, the discrete commutation error was shown numerically to be of the
order of the machine precision. On non-uniform and bounded grids, numerical ex-
periments confirmed the theoretical prediction that the discrete commutation error
depends on both the order of accuracy of the discrete filter operator and the order of
accuracy of the spatial discretization. For discrete filters to be of genuine practical
value, their widths must be prescribed. This leads to the problem of characterization
of discrete filters, that is, how to express their width in terms of quantities such as
the local grid spacing and filter moments. The presentation will describe ongoing
investigations into the characterization of discrete filters.

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