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Toward First- and Higher-Order Discrete Adjoint Flow Solvers

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Traditionally, Algorithmic Differentiation (AD) has been regarded as a method for the computation of derivatives FOR use within numerical algorithms, such as nonlinear solvers and optimizers. More recently, the need for AD OF numerical algorithms has become more apparent. We have been receiving requests for first- and higher-order tangent-linear and adjoint versions of numerical libraries (e.g. the NAG library) as well as of flow solvers such as OpenFOAM. In this talk we discuss first results of black-, grey-, and white-box interpretations of AD principles when applied to numerical algorithms.