## Admissibility preserving IMEX compact Runge-Kutta Flux Reconstruction methods

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Compact Runge-Kutta (cRK) Discontinuous Galerkin (DG) methods, recently introduced in [Q. Chen, Z. Sun, and Y. Xing, SIAM J. Sci. Comput., 46: A1327–A1351, 2024], are a variant of RKDG methods for hyperbolic conservation laws and are characterized by their compact stencil including only immediate neighboring finite elements. There are several phenomenon like chemical reactions which are modeled as stiff source terms in hyperbolic conservation laws. Explicit methods are known to fail at resolving such stiff source terms. In this talk, we present a cRK Flux Reconstruction (cRKFR) scheme with an IMplicit EXplicit (IMEX) discretization to treat stiff source terms. The implicitness is only local in space and thus does not increase the interelement communication. Inclusion of source terms in the cRKFR scheme is done by treating them as time averages. A time average source limiter is proposed that ensures admissibility in means of the IMEX scheme. The capability of the scheme to handle stiff terms is shown through tests involving Burgers' equations, reactive Euler's equations. The scheme is also extended to handle hyperbolic equations with non-conservative products. The extension to non-conservative products is validated through the shear shallow water equations with experimental data.