

# Discontinuous Galerkin time-stepping and fast summation for fractional diffusion and wave equation

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The discontinuous Galerkin method provides a flexible and unconditionally stable time discretization for fractional diffusion and wave equations. I will outline the results of joint work with Kassem Mustapha on the convergence properties of this method, and then describe a fast algorithm for evaluating the discrete memory term. The algorithm employs local degenerate kernel approximations, and is related to the panel clustering technique of Hackbusch and Nowak for fast evaluation of Fredholm integral operators.