

On Oscillations in Discontinuous Galerkin Discretization Schemes for Steady State Problems.

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Abstract. High order Discontinuous Galerkin discretization schemes are considered for steady state problems. We discuss the issue of oscillations arising when Newton's method is employed to obtain a steady state solution. It will be demonstrated that flux approximation near flux extrema may produce spurious oscillations propagating over the domain of computation. The control over the numerical flux in the problem allows one to obtain non-oscillating convergent solutions.

Key words. discontinuous Galerkin, spurious oscillations, Newton's method

AMS subject classifications. 49M15, 65L20, 65L60

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