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Noel J Walkington* (noelw@andrew.cmu.edu), Department of Mathematical Sciences, Forbes Ave, Pittsburgh, PA 15213. *Compactness Properties of Discrete Solutions of Parabolic Equations.*

A classical result of P. Lax states that “a (linear) numerical scheme converges if and only if it is stable and consist”. For nonlinear problems this statement needs to augmented to include a compactness hypotheses sufficient to guarantee convergence of the nonlinear terms. This talk will focus on the development of numerical schemes for parabolic equations that are stable and inherit compactness properties of the underlying partial differential equations. For the discontinuous Galerkin time stepping scheme I will present a discrete analog of the classical Lions-Aubin compactness theorem. Examples will be presented to illustrate how this theorem may be used establish convergence of numerical schemes for nonlinear parabolic problems. (Received January 02, 2010)