On Approximate Solutions for Semilinear Prabolic Problems with Solution and Gradient Depending Nonlinearities

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We study a combined variational (finite element) and quadrature approximation for some semilinear parabolic problems and give semidiscrete (space discretization) error analysis based on nonlinear semigroup techniques and Sobolev imbeddings. Optimal convergence rates are given for both smooth and nonsmooth data and with solution and gradient depending nonlinearities.