On blow up and preventing of blow up of solutions of nonlinear dissipative PDEs

Abstract:

We are going to discuss the impact of convective terms on the global solvability or finite time blow up of solutions of initial boundary value problems for nonlinear dissipative PDEs. We will consider the model examples of 1D Burger’s type equation, convective Cahn-Hilliard equation, generalized Kuramoto-Sivashinsky equation, generalized KdV type equations, and establish that sufficiently strong convective terms prevent solutions from blowing up in a finite time and make the considered systems globally well-posed and dissipative. We will also show that solutions of corresponding equations with weak enough convective terms may blow up in a finite time.