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On the Global Stability of a Nonlinear PDE with a Nonlocal Term

In joint work with Joseph Conlon, we investigate the global stability of the Lifschitz-Slyozov-Wagner model of Ostwald Ripening by introducing a perturbation of a quadratic model studied by Niethammer and Conlon. This model coupled with the mass conservation law generate a nonlinear nonlocal PDE whose asymptotic stability can be proved by examining the stability of a certain nonlinear differential delay equation. We prove an exponential rate of convergence of the solutions of our model to the equilibrium solution for a wide class of initial data.