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Abstract Results on the Finite Extinction Time Property: Application to a Singular Parabolic Equation

We start by studying the finite extinction time for solutions of the abstract Cauchy problem $u_t + Au + Bu = 0$ where A is a maximal monotone operator and B is a positive operator on a Hilbert space H. We use a suitable spectral energy method to get some sufficient conditions which guarantee this property. As application we consider a singular semilinear parabolic equation: $Au = -\Delta u$, $Bu = a(x)u^q$, $a(x) \geq 0$ bounded and $-1 < q < 1$, on a regular bounded domain Ω and Dirichlet boundary conditions.

Keywords: Finite extinction time, abstract Cauchy problems, singular semilinear parabolic equations, semi-classical analysis.