GLOBAL EXISTENCE AND BLOW–UP FOR
NONAUTONOMOUS SYSTEMS WITH NON–LOCAL
SYMMETRIC GENERATORS AND DIRICHLET CONDITIONS

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Abstract. We study a semilinear system of the form
\[ \frac{\partial u_i(t,x)}{\partial t} = k_i(t)A_i u_i(t,x) + u_i^{\beta_i}(t,x), \quad t > 0, \ x \in D, \]
\[ u_i(0,x) = f_i(x), \ x \in D, \ u_i|_{\partial D} = 0, \]
where \( D \subset \mathbb{R}^d \) is a bounded open domain, \( k_i : [0,\infty) \to [0,\infty) \) is continuous, \( A_i \) is the infinitesimal generator of a symmetric jump-type process \( Z_i = \{Z_i(t)\}_{t \geq 0} \), \( \beta_i > 1 \), \( i \in \{1,2\} \) and \( \iota = 3 - i \). Under some assumptions on the infinitesimal generator \( A_i \) of the subprocess \( Z_i \) killed upon leaving \( D \), \( i = 1,2 \), we give sufficient conditions for global existence or finite-time blow-up of the positive mild solutions of our system. This paper can be considered as a continuation of the article [16].


Keywords and phrases: semilinear nonautonomous equations, Dirichlet problem, ultracontractive semigroup, Markov evolution systems, finite-time blow up.

REFERENCES


