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Min Kang* (kang@math.ncsu.edu), Department of Mathematics, NC State University, Raleigh, NC 27695. *Immortal Particle for a Catalytic Branching Process.*

We study the existence and asymptotic properties of a conservative branching particle system driven by a diffusion with smooth coefficients for which birth and death are triggered by contact with a set. Sufficient conditions for the process to be non-explosive are given in relation to the eikonal equation. In the Brownian motions case the domain of evolution can be non-smooth, including Lipschitz, with integrable Martin kernel. The results are valid for an arbitrary number of particles and non-uniform redistribution after jump. Additionally, with probability one, it is shown that only one ancestry line survives. In special cases, the evolution of the surviving particle is studied and for a two particle system on a half line we derive explicitly the transition function of a chain representing the position at successive branching times. (Received September 05, 2010)