A persistense result for a critical multitype branching system

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Abstract: We consider a critical branching system of particles living in R^d with a finite number of types, in which an individual of type i lives a random lifetime with distribution functions Γ_i, during which it moves according to a symmetric α_i-stable motion. We consider the case when the lifetime distribution Γ_1 of particles of type 1 has a power tail $t^{-\gamma}, \gamma \in (0, 1]$, while the lifetimes of the other particle types have finite means. Under the usual independence assumptions in branching systems, we obtain a sufficient condition for the persistence of the system which is valid for a class of branching laws. Our result compelements the extinction result obtained by Kevei and Lopez-Mimbela [1].

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References

[1] P. Kevei, J.A. Lopez-Mimbela (2011). Critical Multitype Branching Systems: Extinction Resuilt. *Electronic Journal of Probability*, **16**, 1356-1380.