Asymptotic Behavior of Extinction Probability of Interacting Branching Collision Processes

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Abstract: Although the exact expressions for the extinction probability of Interacting Branching Collision Process (IBCP) have been given recently, see Chen et al [1], these expressions are sometimes very complicated and thus quite informative, particularly regarding the asymptotic behavior. In this talk, the latter problem will be addressed in detail. We shall show that for large n, the extinction probability (a_n) is proportional to $n^\alpha q^n$ where q is the smallest positive root of $C(s) = 0$ on the interval of $[0, 1]$ and $C(s)$ is the generating function of the rates of the collision component. The interesting quantity α is exactly given which is extremely informative.

References

[1] A.Y. Chen, J.P. Li, Y.Q. Chen and D.X. Zhou (2012). Extinction Probability of Interacting Collision Branching Processes, *Adv, Appl. Prob.*, **44**, 226-259.