# ON A LIMIT STRUCTURE OF THE GALTON–WATSON BRANCHING PROCESSES WITH REGULARLY VARYING GENERATING FUNCTIONS

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*Abstract:* We investigate limit properties of discrete time branching processes with application of the theory of regularly varying functions in the sense of Karamata. In the critical situation we suppose that the offspring probability generating function has an infinite second moment but its tail regularly varies. In the noncritical case, the finite moment of type $\mathbb{E}[x \ln x]$ is required. The lemma on the asymptotic representation of the generating function of the process and its differential analogue will underlie our conclusions.

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