The Seneta-Heyde Scaling for Stable Branching Random Walk

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Abstract: We consider a discrete-time branching random walk in the bound case, where the associated one-dimensional random walk is stable. We prove the derivative martingale D_n converges to a non trivial limit D_∞ under certain moment conditions. Moreover, we study the additive martingale W_n and prove that $n^{\frac{1}{\alpha}}W_n$ converges in probability, but not almost surely, to cD_∞. This is a joint work with Hui He and Jingning Liu.