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# CRITERIONS OF THE SIMILARITY FOR RANDOM WALKS AND BIRTH-AND-DEATH PROCESSES

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*Abstract:* This paper is devoted to study the similarity of birth-and-death processes with a discrete and continuous time. We discuss some relations between the measures of orthogonality of the associated polynomials and the first return probabilities of two $\alpha$-similar random walks and two $\nu$-similar birth-and-death processes. We give the necessary and sufficient conditions for $\alpha$-similarity of two random walks both in terms of the corresponding spectral measures. We consider analogous conditions for $\nu$-similarity of two birth-and-death processes.

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