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On Non-ergodic Volterra Cubic Stochastic Operators

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Abstract

Let S_m-1 be the simplex in R_m , and $V: S_m-1 \rightarrow S_m-1$ be a nonlinear mapping then this operator satisfies an ergodic theorem if the limit $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \mathbb{1}_{\{x \in A\}}(V^k(x))$ exists for every x is an element of S_m-1 . It is a well known fact that this ergodicity may fail for Volterra quadratic operators, so it is natural to characterize all non-ergodic operators. However, there is an ongoing problem even in the low dimensional simplexes. In this paper, we solve the mentioned problem within Volterra cubic stochastic operators acting on two-dimensional simplex.

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