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Tightness of probability measures on function spaces

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Abstract

Let $CE = C([0, 1], E)$ be the Banach space, with the supremum norm, of all continuous functions f from the unit interval $[0, 1]$ into the Banach space E . If $E = \mathbb{R}$ we put $CR = C$. Function spaces under consideration are equipped with their Borel σ -field. This paper deals with the tightness property of some classes of probability measures (p.m) on the function space CE . We will be concerned mainly with the specific cases $E = \mathbb{R}$, $E = \mathbb{C}$ and more generally E a separable Banach space. We give sufficient conditions for tightness by extending and strengthening the conditions developed by Prohorov in connection with limit theorems of stochastic processes. In the general case of a separable Banach space E , the property of tightness will be settled under conditions of different nature from those of Prohorov. Finally weak convergence of p.m on CE will be established under the condition of weak convergence of their finite dimensional distributions. This extends a similar result valid in the space C . © 2008 Elsevier Inc. All rights reserved.

Author Keywords

Relative compactness; Tightness of probability measures; Weak convergence

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