

Stone-Weierstrass type theorems for large deviations

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Abstract

We give a general version of Bryc's theorem valid on any topological space and with any algebra \mathcal{A} of real-valued continuous functions separating the points, or any well-separating class. In absence of exponential tightness, and when the underlying space is locally compact regular and \mathcal{A} constituted by functions vanishing at infinity, we give a sufficient condition on the functional $\Lambda(\cdot)_{\mid \mathcal{A}}$ to get large deviations with not necessarily tight rate function. We obtain the general variational form of any rate function on a completely regular space; when either exponential tightness holds or the space is locally compact Hausdorff, we get it in terms of any algebra as above. Prohorov-type theorems are generalized to any space, and when it is locally compact regular the exponential tightness can be replaced by a (strictly weaker) condition on $\Lambda(\cdot)_{\mid \mathcal{A}}$.

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