

The shortest possible return time of β -mixing processes

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Abstract

We consider a stochastic process and a given n -string and study the shortest possible return time (or shortest return path) of the string over all the realizations of process starting from this string. For a β -mixing process having complete grammar, and for each size n of the strings, we approximate the distribution of this short return (properly re-scaled) by a non degenerated distribution. Under mild conditions on the β coefficients, we prove the existence of the limit of this distribution to a non-degenerated distribution. Finally, we prove a connection of the shortest return with the Shannon entropy, showing that maximum of the re-scaled variables grow as the matching function of Wyner and Ziv. It is join work with Miguel Abadi and Sandro Gallo.