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# Return Times and Waiting Times as Entropy Estimators: Large Deviations

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Once the sequence $(n^{-1} \ln R_n)$ of return times introduced in Renaud's talk has been shown to satisfy a law of large numbers, a natural question is to study its large deviations. Quite surprisingly, very limited results were available. In a recent paper with Renaud Raquépas, we proved that the return times satisfy the full large deviation principle, again under some quite mild decoupling assumptions. I will present this result and outline the proof. As we will show, we find a natural expression for the large-deviation rate function. Moreover, if the definition of $R_n$ allows for some "overlaps", we will see that the rate function is nonconvex in general.

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