Higher Order Asymptotics for Large Deviations

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For sequences of weakly dependent random variables, we obtain asymptotic expansions for Large Deviation Principles. These expansions, commonly referred to as strong large deviation results, are in the spirit of Edgeworth Expansions for the Central Limit Theorem. Motivated by studying branching diffusion processes in periodic media, we obtain such expansions for additive functionals of solutions of SDE's on a compact manifold. This is joint work with Kasun Fernando.