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# Fluctuation Analysis of Adaptive Multilevel Splitting

Arnaud Guyader<sup>\*†1</sup>

<sup>1</sup>Laboratoire de Statistique Théorique et Appliquée (LSTA) – Université Pierre et Marie Curie (UPMC)  
- Paris VI – Université Pierre et Marie Curie (Paris 6) Tour 15-25 2-ième étage Boite courrier 158 4,  
place Jussieu 75252 Paris Cedex 05, France

## Abstract

Multilevel Splitting, also called Subset Simulation, is a Sequential Monte Carlo method to simulate realisations of a rare event as well as to estimate its probability. This talk is concerned with the convergence and the fluctuation analysis of Adaptive Multilevel Splitting techniques. In contrast to their fixed level version, adaptive techniques estimate the sequence of levels on the fly and in an optimal way, with only a low additional computational cost. However, very few convergence results are available for this class of adaptive branching models, mainly because the sequence of levels depends on the occupation measures of the particle systems. We will present the consistency of these methods as well as a central limit theorem. In particular, we show that the precision of the adaptive version is the same as the one of the fixed-levels version where the levels would have been placed in an optimal manner.

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\*Speaker

†Corresponding author: [arnaud.guyader@upmc.fr](mailto:arnaud.guyader@upmc.fr)