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Adaptive Multilevel Splitting for Monte Carlo particle transport

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In the Monte Carlo simulation of for particle transport, and especially for shielding applications, variance reduction techniques are widely used to help simulate realisations of rare events, and reduce the relative errors on the estimated scores for a given computation time. Adaptive Multilevel Splitting (or AMS) is one of these variance reduction techniques that has recently appeared in the literature. For the time being, it has only been applied to the field of molecular dynamics. The purpose of my thesis is to try and apply this method to Monte Carlo particle transport. The original algorithm has been adapted to the frame of particle transport, and implemented into the Monte Carlo transport code TRIPOLI-4[®], developed by the Service d'Étude des Réacteurs et de Mathématiques Appliquées (SERMA) at CEA Saclay. I will show that the preliminary results are promising.

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