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Density of State method for complex action systems

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While importance sampling Monte Carlo algorithms have proved to be a crucial tool for numerical studies in modern physics, they fail when we take into consideration complex action systems. The density of states approach provides a way to simulate such systems and reduce the sign problem that afflicts them to a 1-dimensional oscillatory integral.
In this talk, I will review the density of states approach as well as the Linear Logarithmic Relaxation algorithm and present some recent development concerning the bias control of the latter. The results of a benchmark study on the relativistic Bose gas will be presented as well.

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