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Flash-3: Monte Carlo for initial energy density with correlated fluctuations

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We present a new Monte Carlo that generates events based on statistics specified with any 1-point and 2-point function, including arbitrary correlations. Such a code can be useful for quickly generating events when analytic formulas are known (for example from recent derivations of CGC fluctuations), and for use in Bayesian analyses, where the initial state can be characterized by physical-meaningful parameter such as mean energy density, variance, skewness, correlation length, etc. We use the new code to perform investigations of CGC fluctuations. We study the effect of model parameters such as saturation scale and regulators (both infrared and ultraviolet), as well as the effects of higher-order fluctuations, which are currently unknown. This provides useful information, even beyond the particular model, of how such fluctuation and correlation properties can appear in observable quantities. We investigate how correlated and uncorrelated events compare, and quantify the sensitivity of relevant properties such as eccentricities ε_n to correlation lengths

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