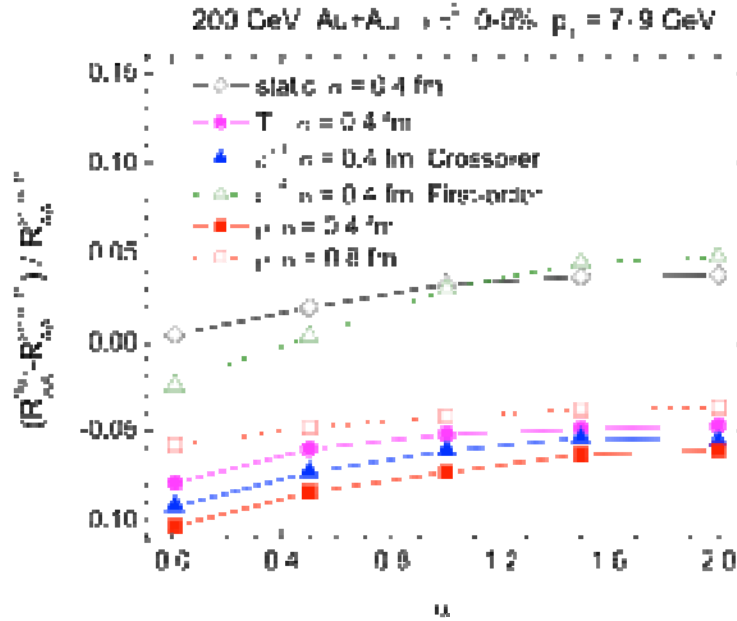


## Effects of initial fluctuations on jet-energy loss

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Based on the 2+1 dimension ideal hydrodynamics, we have studied the effect of initial fluctuations on jet energy loss in relativistic heavy-ion collisions within the description of the NLO perturbative QCD [1]. Our results show that fluctuating initial conditions lead to slightly more energy loss than smooth initial conditions as shown in Fig.1. A detailed analysis indicates that this is mainly due to the positive correlation between the fluctuation in the production probability of parton jets from initial nucleon-nucleon hard collisions and the fluctuation in the medium density along the path traversed by the jet. This effect is larger in non-central than in central relativistic heavy ion collisions and also for jet energy loss that has a linear ( $\alpha = 1$ ) than a quadratic ( $\alpha = 2$ ) dependence on its path length in the medium. Our results are opposite to those found in Ref.[2] for a static medium and also those in Ref.[3] using a 2+1 ideal hydrodynamics and with the jet energy loss depending on the local energy density, which show a reduced jet energy loss in the QGP for the fluctuating initial conditions.



**FIG. 1.** Relative difference between the nuclear modification factors of  $p_T = 7.9$  GeV hadrons as a function of the path-length dependence parameter  $\alpha$  for different medium dependence in central Au+Au collisions.

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