

SEARCH FOR A RIDGE STRUCTURE ORIGIN WITH SHOWER BROADENING AND JET QUENCHING

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Recently, an interesting structure is discovered in two particle ϕ - η correlation at RHIC. This structure, which is called ridge structure, have narrow and broad widths in ϕ and η directions, respectively [1]. Since ridge cannot be understood in simple jet fragmentation, various pictures have been proposed so far [2,3]. Firstly, to explore the origin of the ridge structure, we investigate two-hadron correlations in a jet-fluid string (JFS) model which is suggested to work in high p_T region. In a present treatment, a jet parton loses its energy in QGP, and forms a string with a fluid parton when it goes out from QGP. Finally, hadrons are formed by string fragmentation. It is demonstrated that this model explains jet quenching, large elliptic flows at high p_T and suppression of the back-to-back correlation simultaneously [4]. However, we find that we cannot describe the ridge structure in two particle ϕ - η correlation in JFS. We have recently found that broadening of shower partons before thermalization [5] followed by parton energy loss could generate a ridge-like structure. Strong color electric and magnetic fields just after collisions (the so-called Glasma) can be attributed to the broadening phenomenon. As a result of the energy loss, correlations at large $\Delta\phi$ are suppressed, then the ridge-like structures are left.

References

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