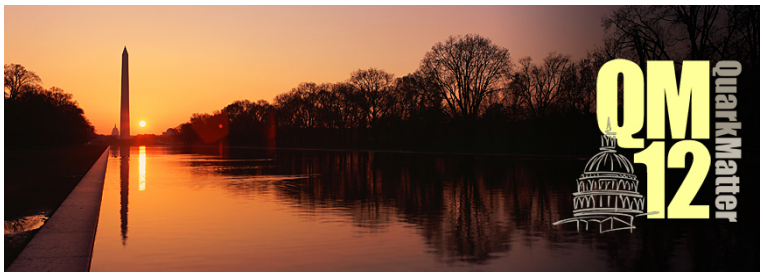

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Two-baryon correlations in heavy-ion collisions at the LHC

Thursday 16 August 2012 16:00 (2 hours)

In heavy-ion collisions produced at the LHC a significant number of baryons is emitted in each collision. Two-particle correlations of those baryons carry important information about the emitting source and the interaction between them.

At low relative momentum femtoscopic correlations arise, which are sensitive to the homogeneity lengths of the system. Hydrodynamic models predict that these will decrease with increasing transverse mass of the pair. Such a decrease is universally reported for pions, also at the LHC. Baryons, having a much larger mass, allow to significantly extend the range of measured m_T. The results from baryon femtoscopy would put a strong constraint on such predictions. Non-identical baryon pairs are also sensitive to emission asymmetries.

Femtoscopic correlations between baryons arise mostly due to the strong interaction, which is not precisely known for some baryon pair types. The most notable example is the lambda-lambda interaction which has an unknown contribution due to the potential existence of the H0 dibaryon. Equally interesting are baryon-antibaryon potentials, which have significant contributions from annihilation channels. These processes may have an impact on single-particle spectra, and should be investigated as one of the possible sources of the small proton yield at the LHC.

We show the two-particle correlation functions for several pair types (both baryon-baryon and baryon-antibaryon) composed of protons and lambdas. Femtoscopic analysis is carried out for proton pairs, taking into account residual correlations and annihilation
channel for the proton-antiproton system. Correlations with lambdas are also analyzed, both with femtoscopic methods as well as to study the unknown interaction potentials.

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