Update on 7 TeV pp ➔ $K^0_s K^0_s$ analysis

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ALICE Week Femto Meeting

Summary of pp➔ $K^0_s K^0_s$ analysis progress since QM2011

Ran over PHOJET anchor runs to better estimate baseline systematic error

➔PHOJET describes $C(Q_{inv})$ baseline with similar accuracy as PYTHIA, gives smaller systematic errors than before, multiplicity dependence of R better articulated

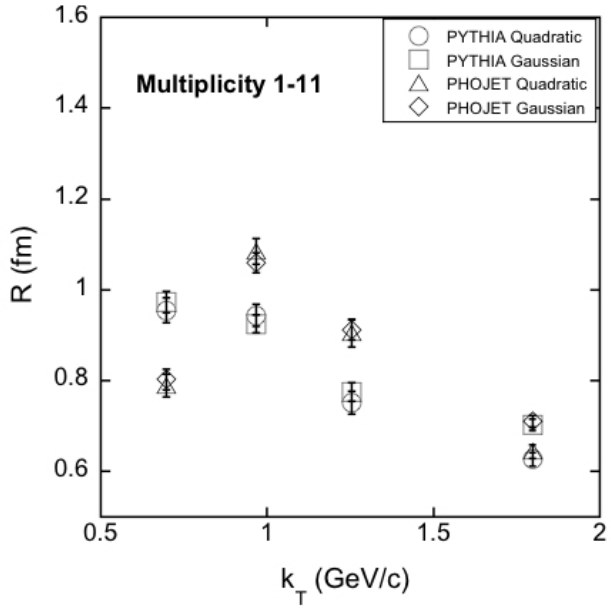
Studied ±10% Q_{inv} fit range effect on systematic error

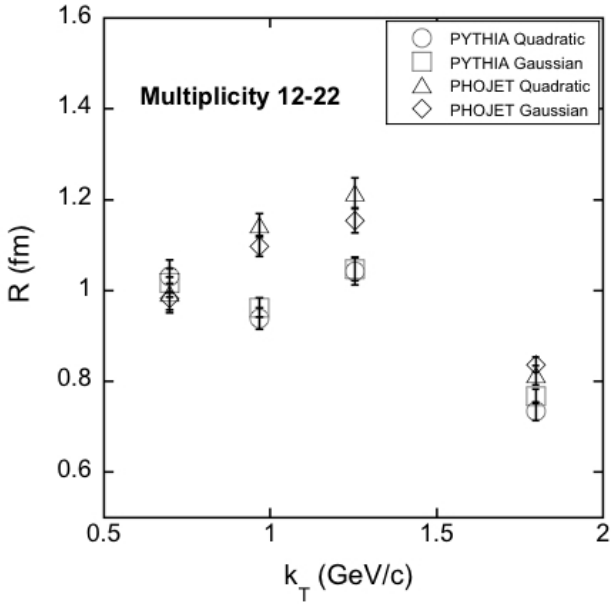
➔Systematic error from this comparable with statistical errors

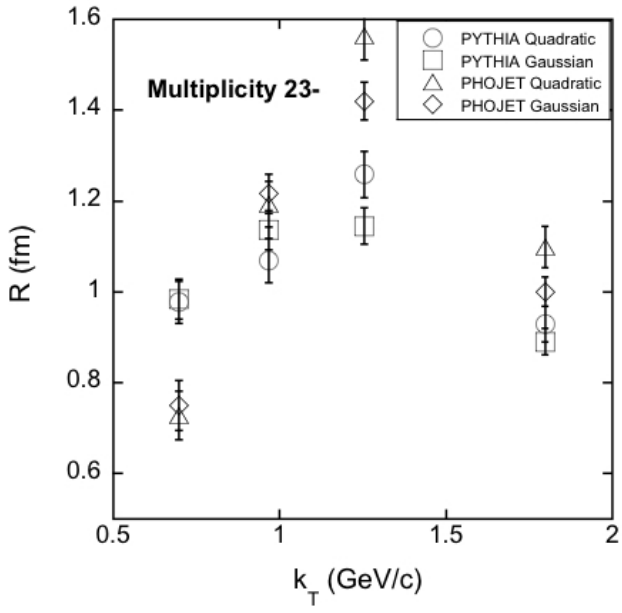
Made a simple geometric model to compare with data results for R to determine if trivial geometry effects can be eliminated as an explanation for multiplicity and k_T dependences seen in data

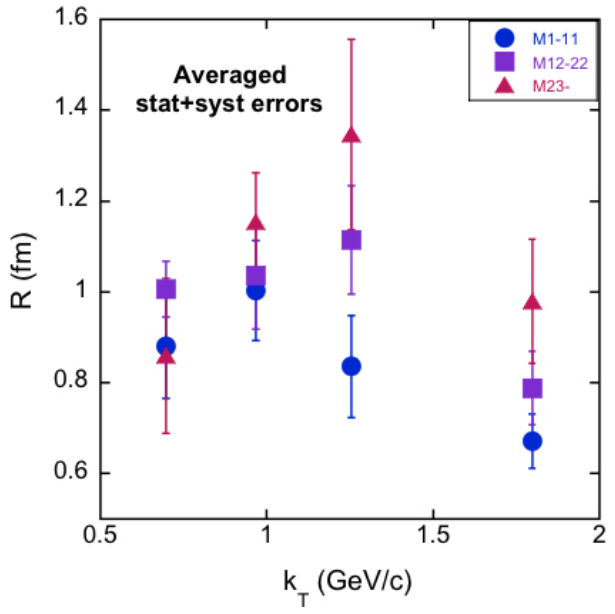
➔This indeed seems to be the case -- need additional physics to describe data

R from Lednicky using PYTHIA and PHOJET baselines



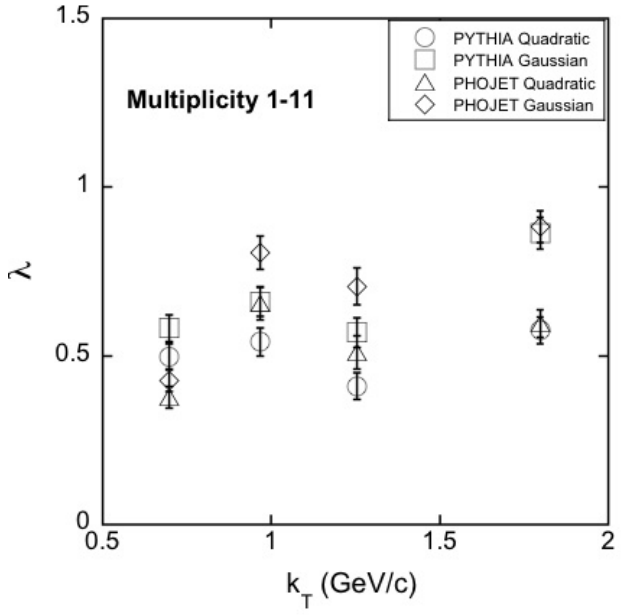


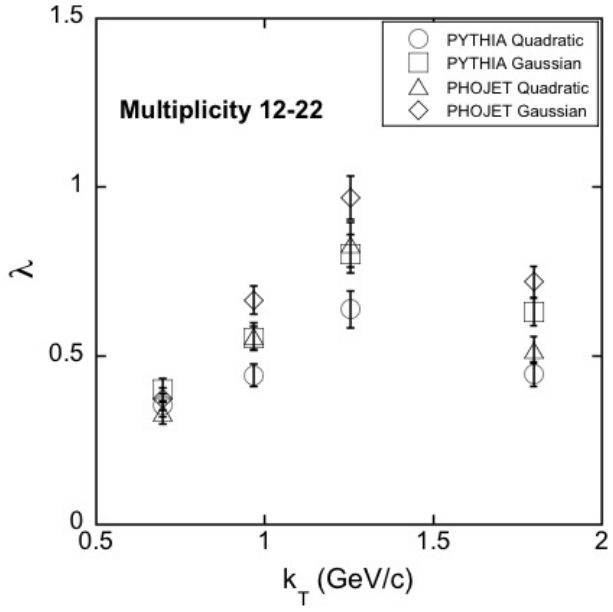


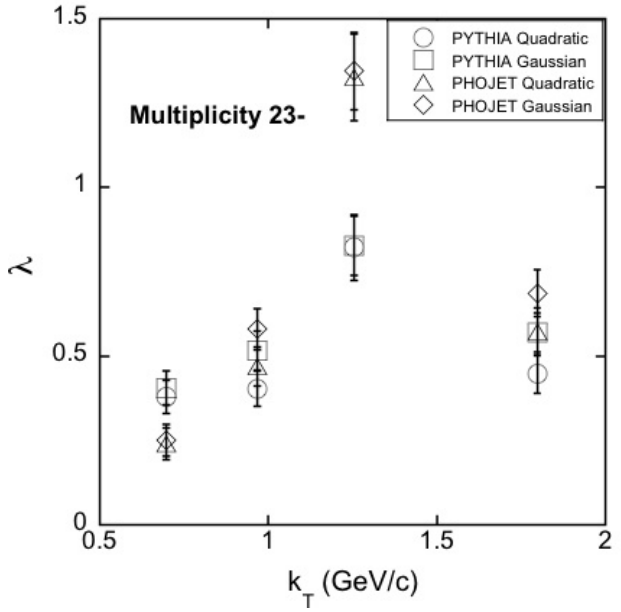


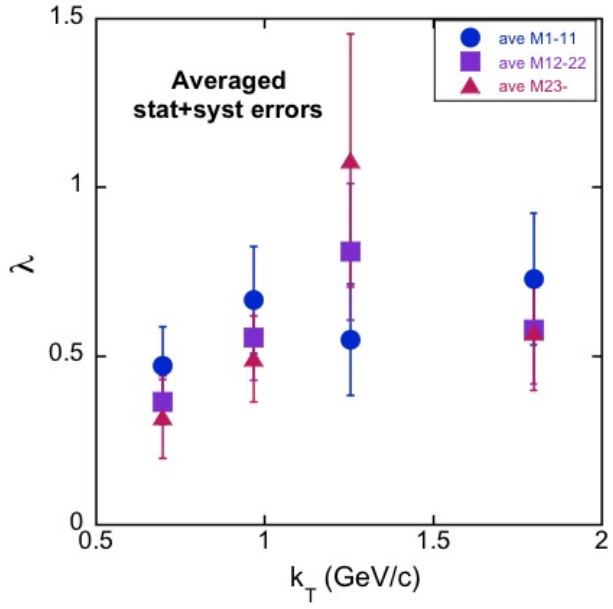
Systematic error includes S.D. of the four baseline methods and a ±10% variation on the Q_{inv} fit range

λ from Lednicky using PYTHIA and PHOJET baselines



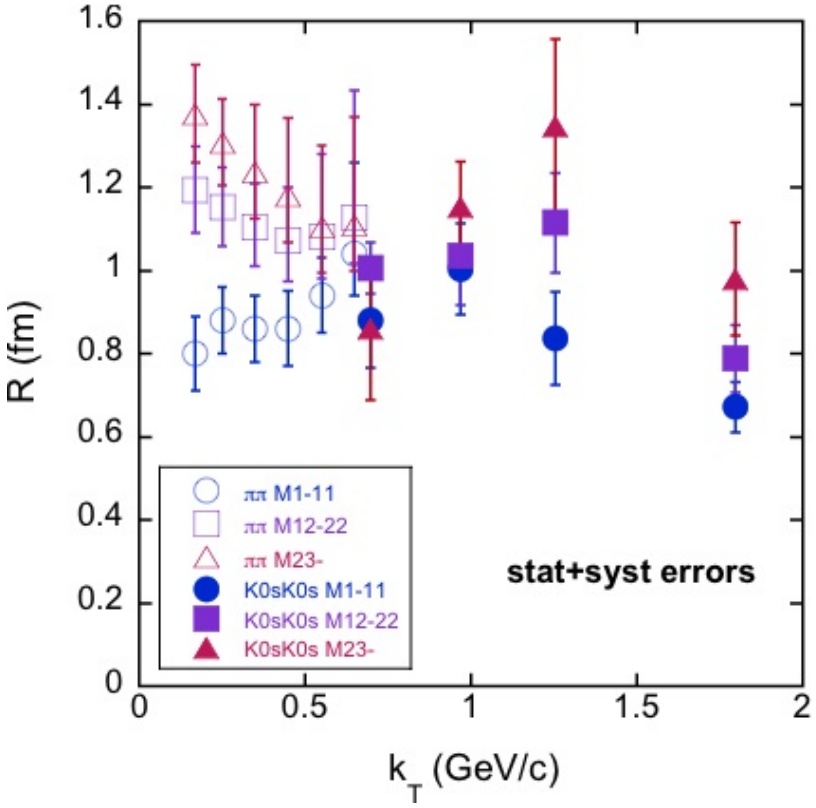


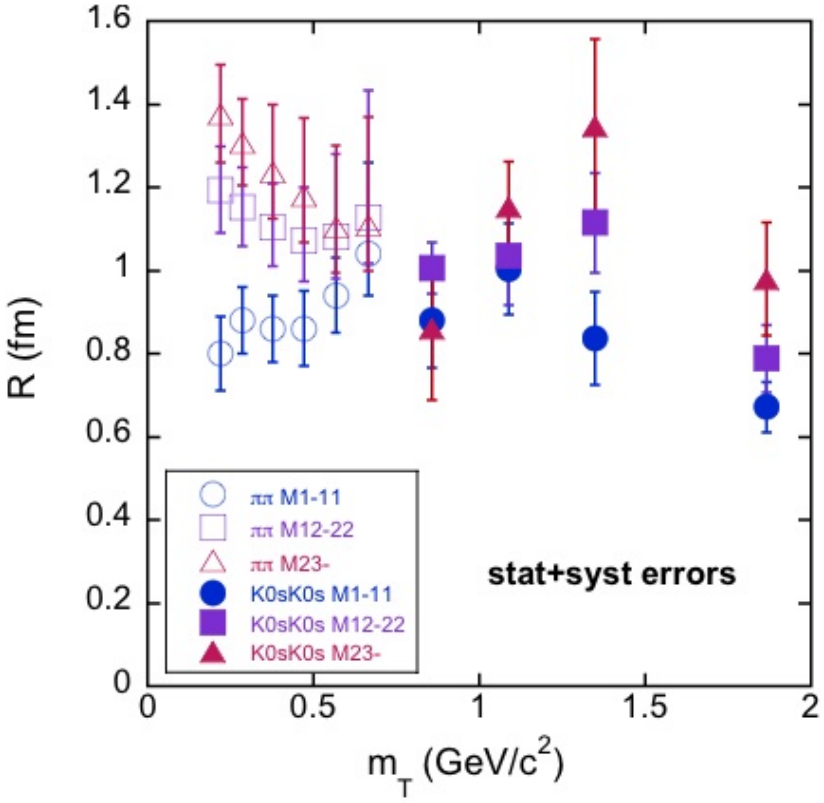




Systematic error includes S.D. of the four baseline methods and a ±10% variation on the Q_{inv} fit range

Comparison of R for ππ and $K^0_s K^0_s$





Simple Geometrical Model for 7 TeV pp ➔ $K^0_s K^0_s$ HBT

Impose a geometry on K^0_s hadronization from ALICE PYTHIA-Perugia0 events

Assume an exponentially distributed, exp(-τ/T), proper hadronization time for K^0_s which defines the hadronization space-time via causality, i.e.,

$t = \tau(E/m)$, $x = \tau(p_x/m)$, $y = \tau(p_y/m)$, $z = \tau(p_z/m)$, where m = K^0_s mass,

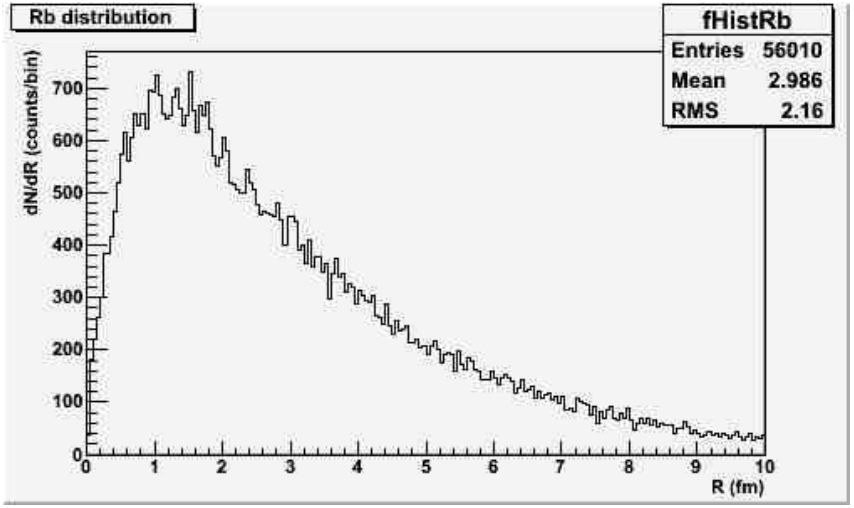
and T = 1.8 fm/c ➔ only free parameter in Model

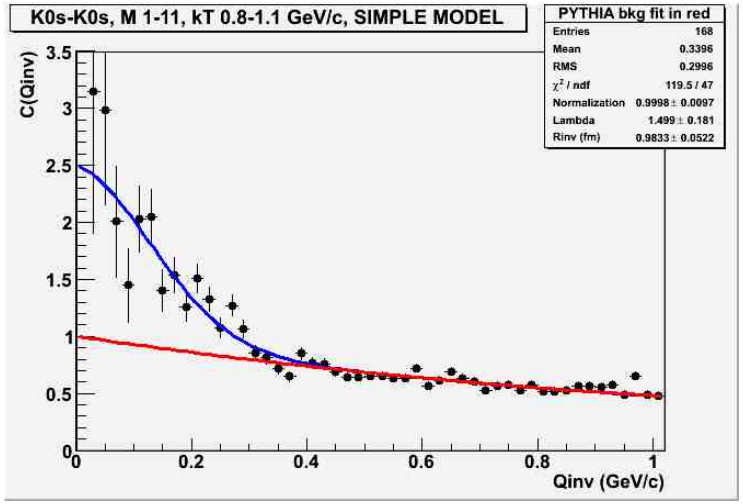
Impose HBT on the PYTHIA $K^0_s K^0_s$ pairs using 1+cos(ΔxΔp-ΔtΔE) and bin in Q_{inv}

Use the same PYTHIA anchor runs as the data.

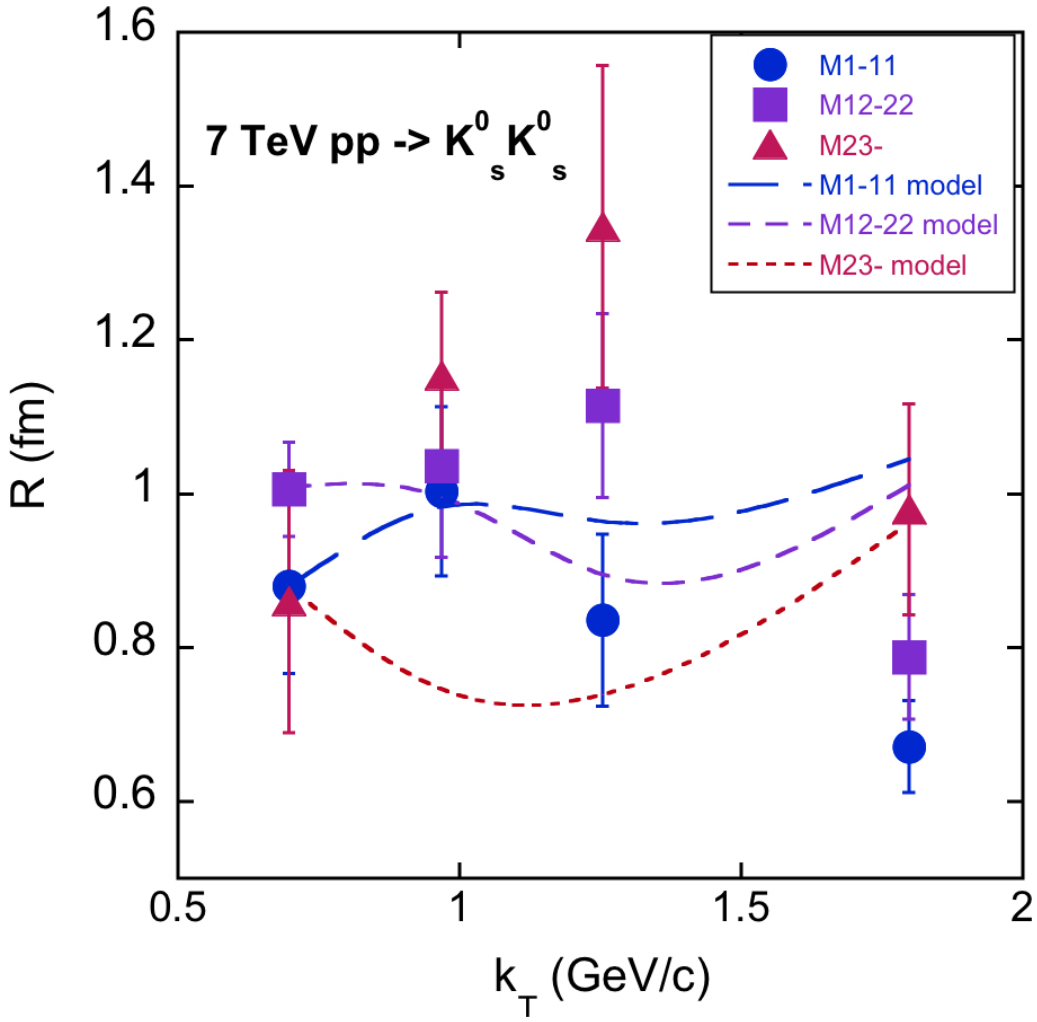
Fit the model $C(Q_{inv})$ using the same method as used for the data to extract R and λ

Sample K^0_s hadronization radius distribution and $C(Q_{inv})$ for the bin M1-11, k_T 0.8-1.1 GeV/c





Comparison of geometric model with data for R



The simple geometrical model does not account for most of the features seen in the data

➔ Suggests that other physics needed to explain data, e.g. flow