

Introduction

It was proposed by A. Bialas and R. Peschanski (Nucl. Phys. B 273 (1986) 703) to study the dependence of the normalized factorial moments

$$F_i = M^{i-1} \times \left\langle \frac{\sum_{j=1}^M k_j \times (k_j - 1) \times \dots \times (k_j - i + 1)}{N \times (N - 1) \times \dots \times (N - i + 1)} \right\rangle$$

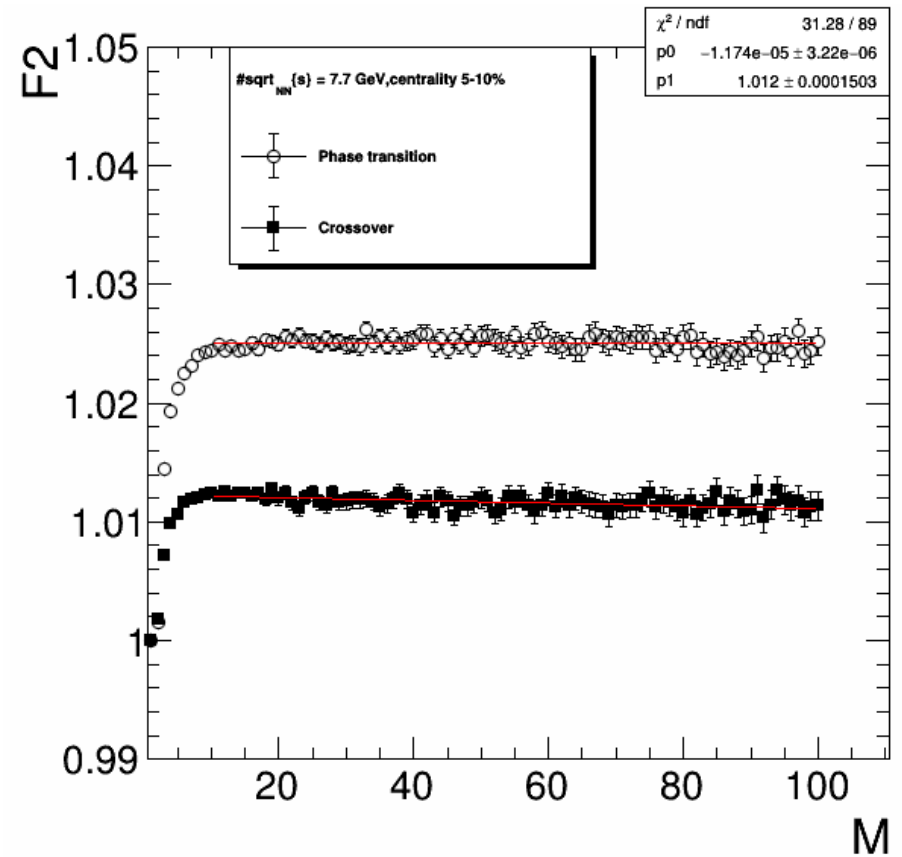
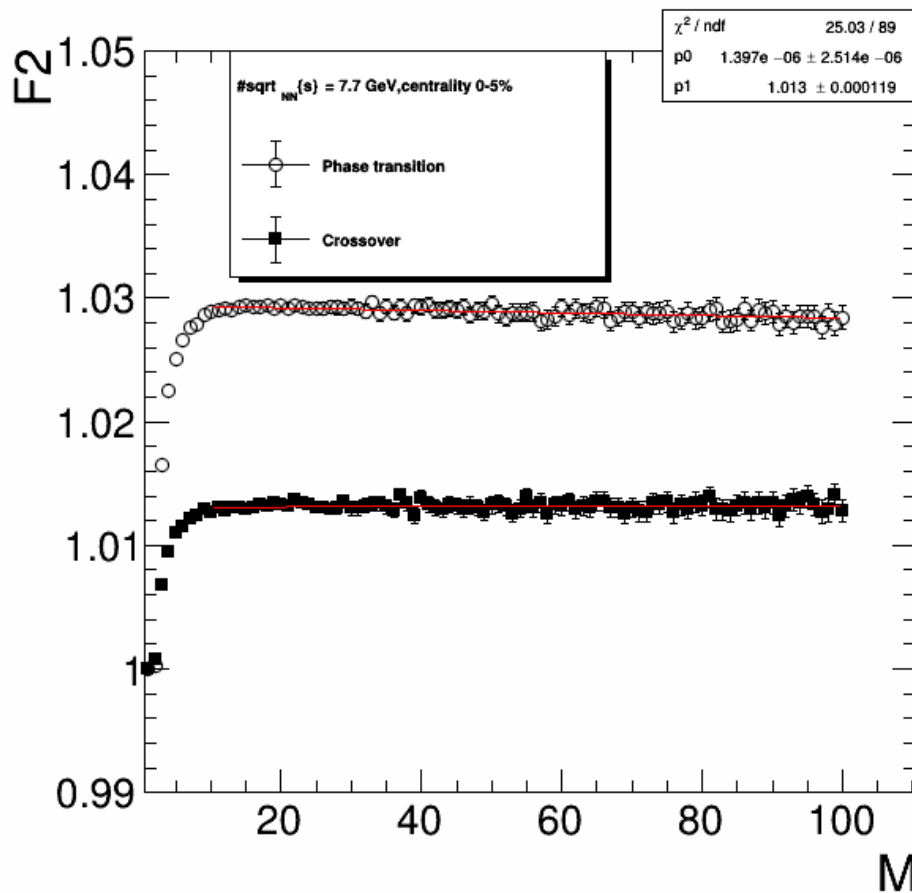
Note: there is a set of definitions of moments and cumulants.

of the rapidity distribution on the size δy ($\Delta y/M$, M is the number of bins, Δy is the size of the mid rapidity window):

1. if fluctuations are purely statistical no variation of moments as a function of δy is expected
2. Observation of variations indicates the presence of physics origin fluctuations

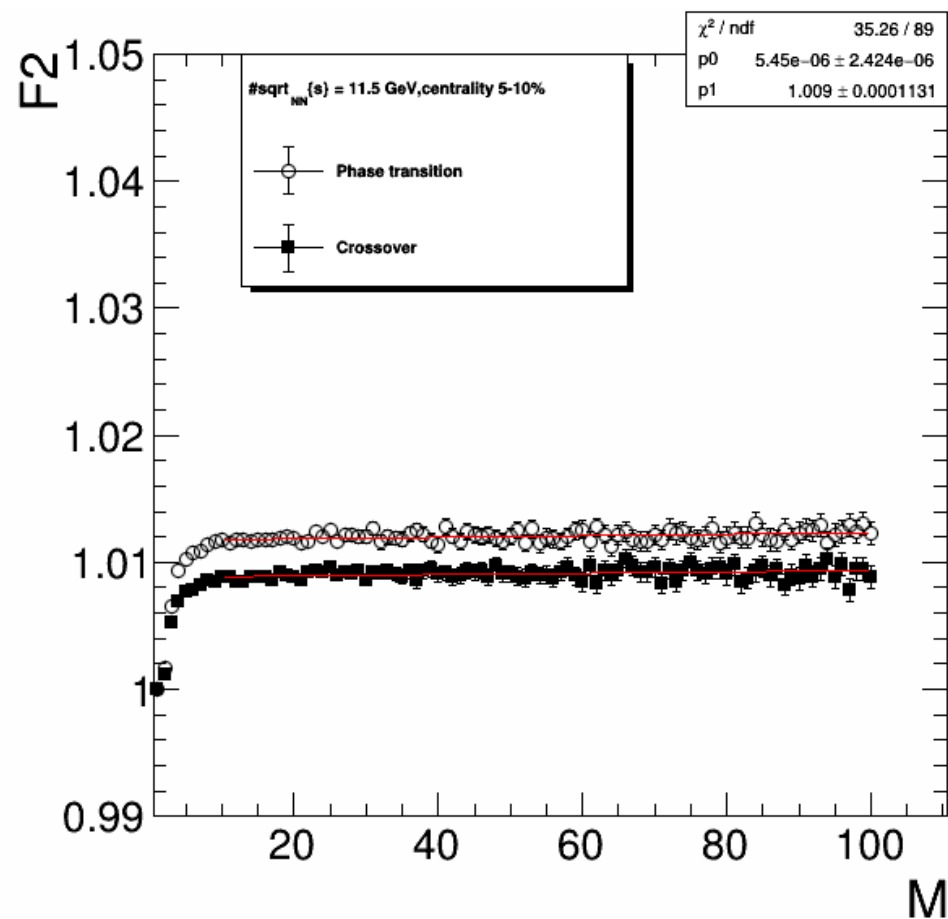
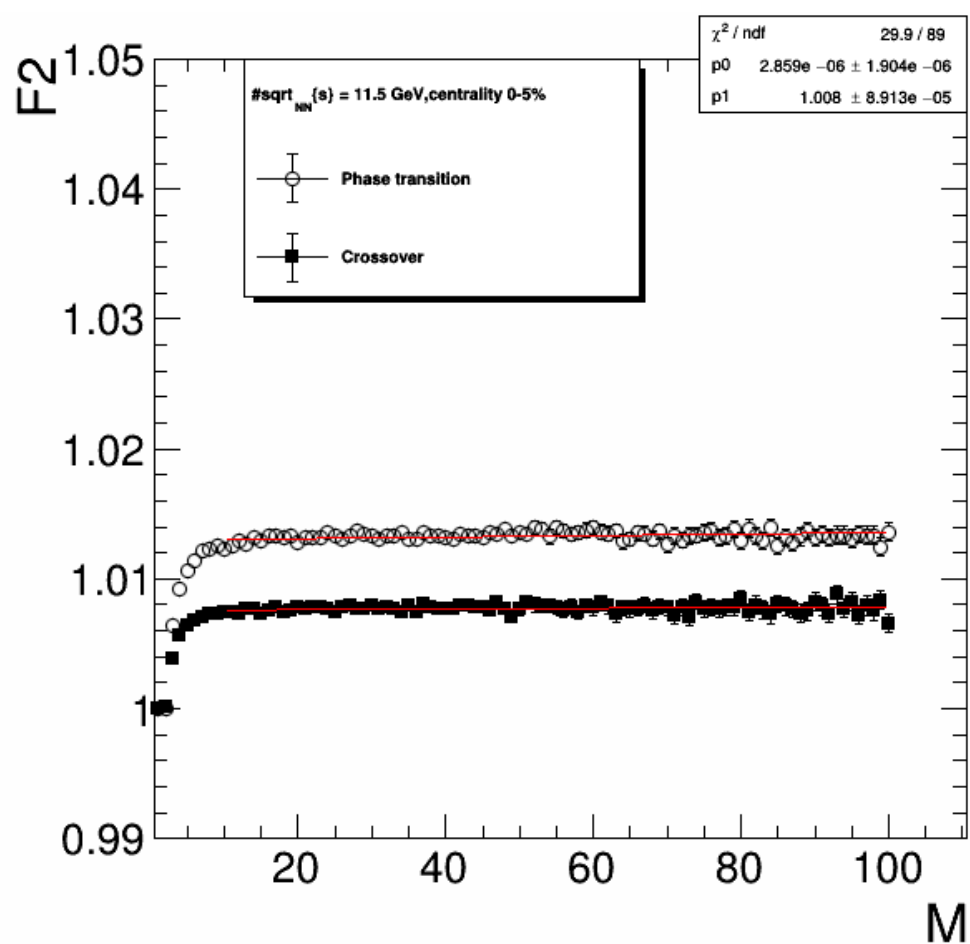
Intermittency (fluctuations of various different sizes in 1D, 2D and 3D phase space) have been studied at LEP, Tevatron, Protvino in ee, hh, hA, AA interactions at the various energies.

Au-Au, 7.7 GeV, URQMD+VHILLE



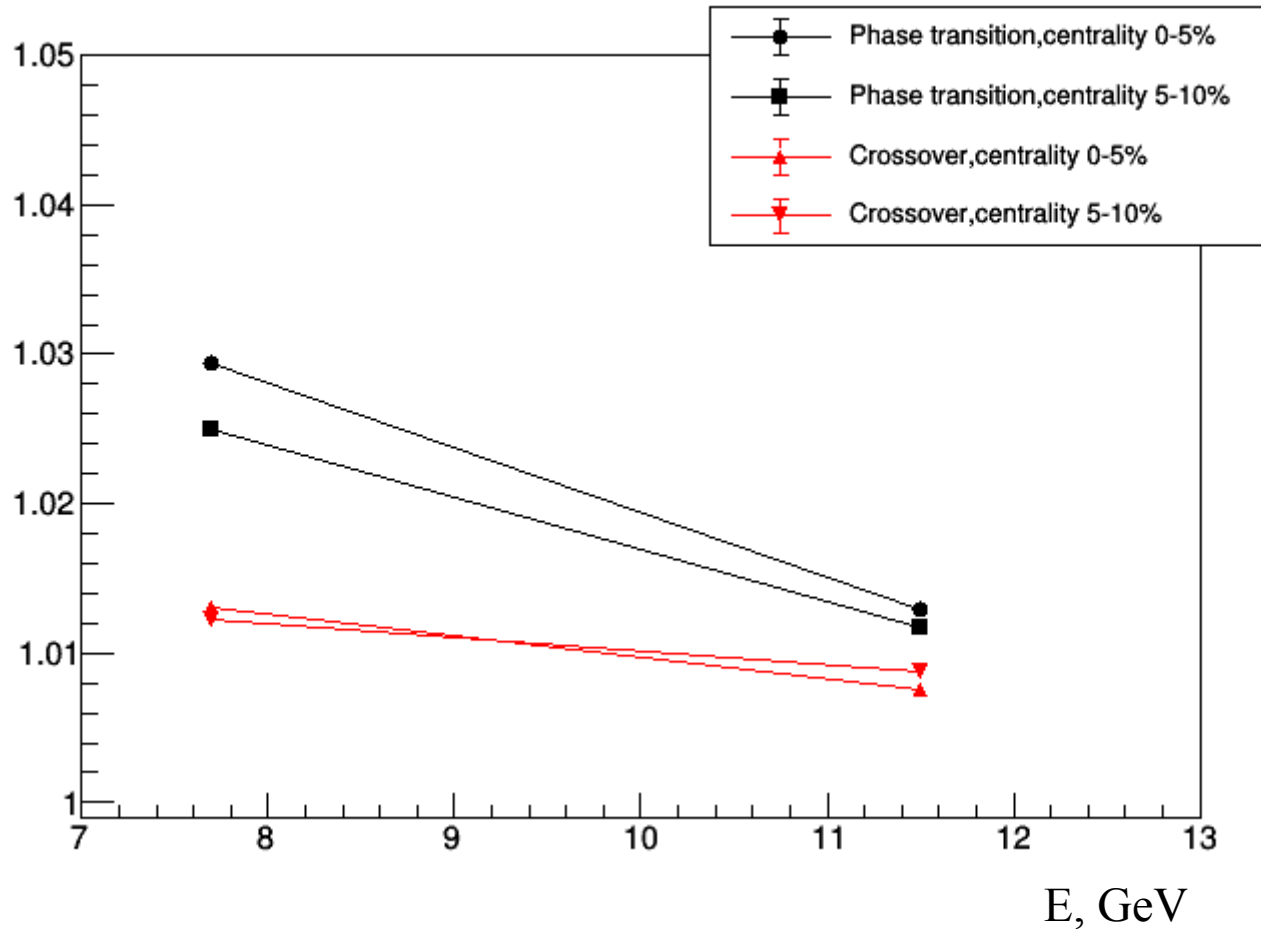
Fit the level of maximum with polinom of the first order: $a+b \times M$
b is of the order of 10^{-6}

Au-Au, 11.5 GeV, URQMD+VHILLE



Energy dependence , URQMD+VHLLLE

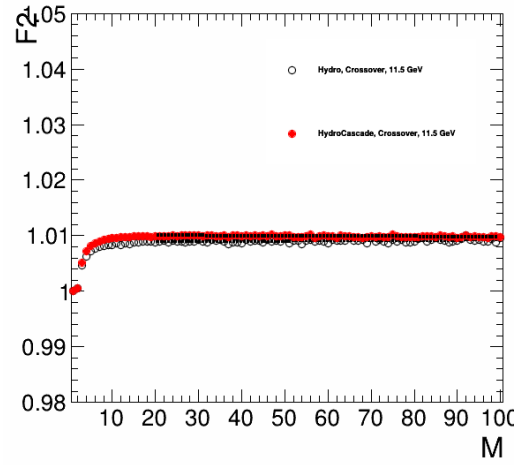
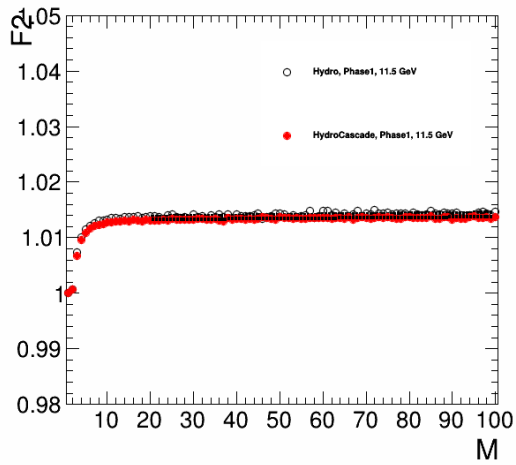
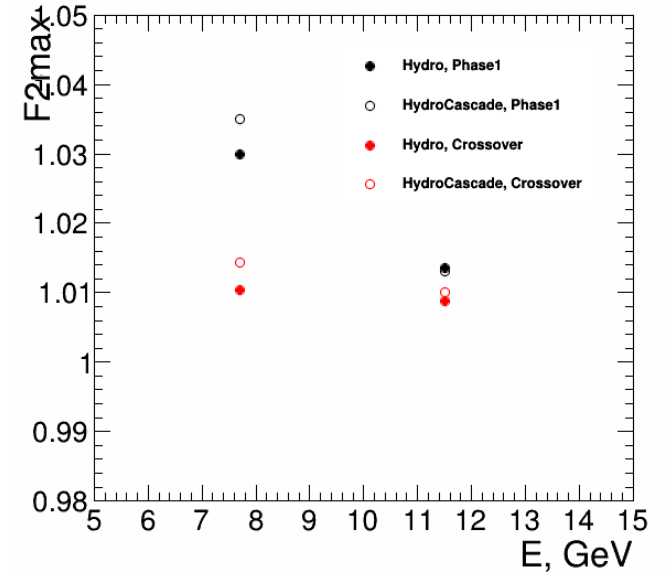
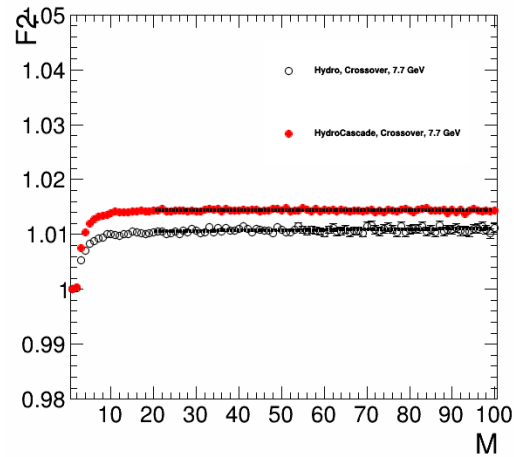
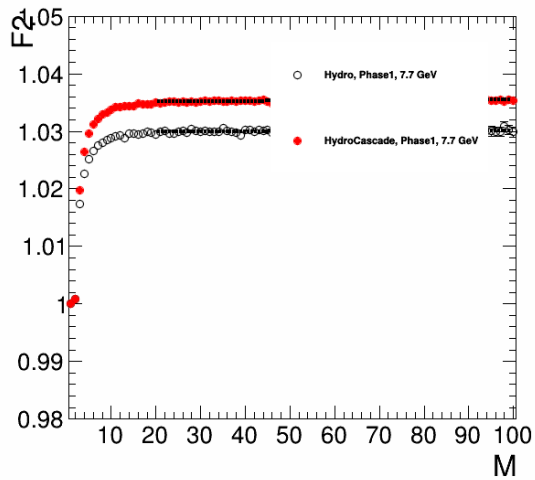
F2 maximum



Plot the F_2 max as a function of energy.

Different energy Dependence is Expected for Crossover and the 1st order phase transition

Hydro and HydroCascade separately



There is a small increase of the F_2 maximum for HydroCascade. w.r.t Hydro only. However the different trend in the F_2 behaviour for the Phase 1 transition and crossover is visible

Reconstruction tracking efficiency as a function of the track p_T

