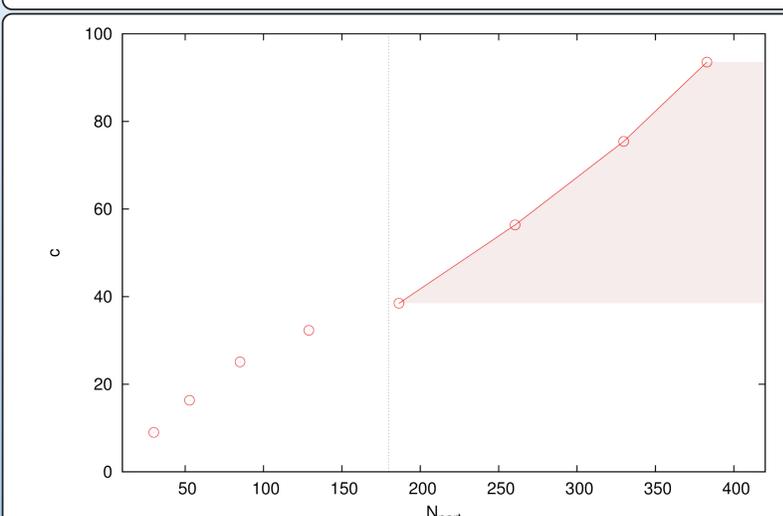
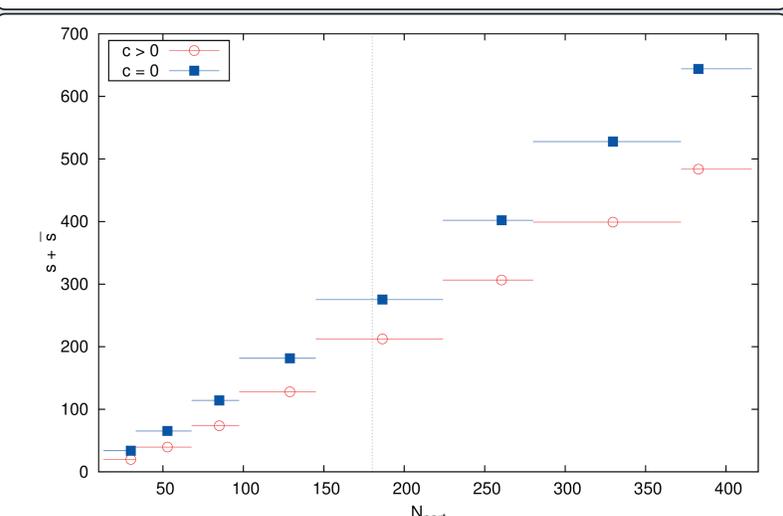
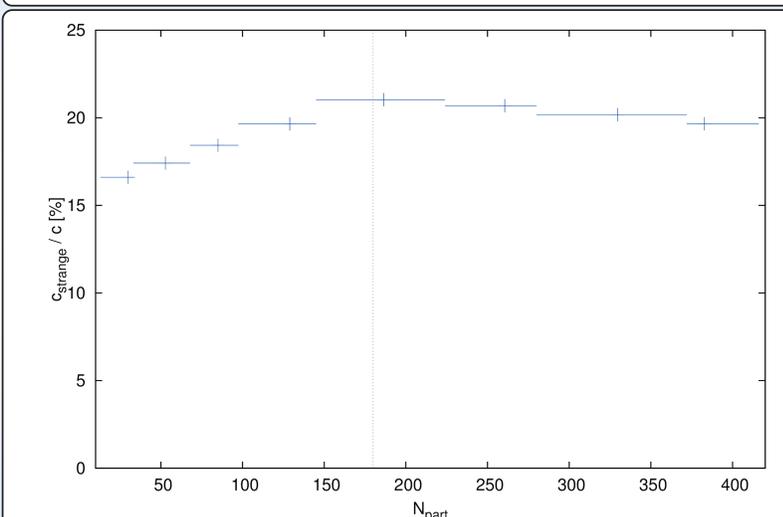
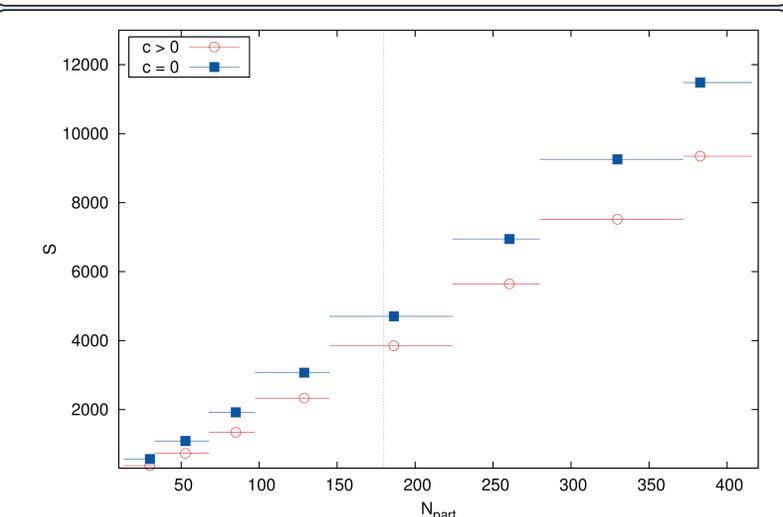
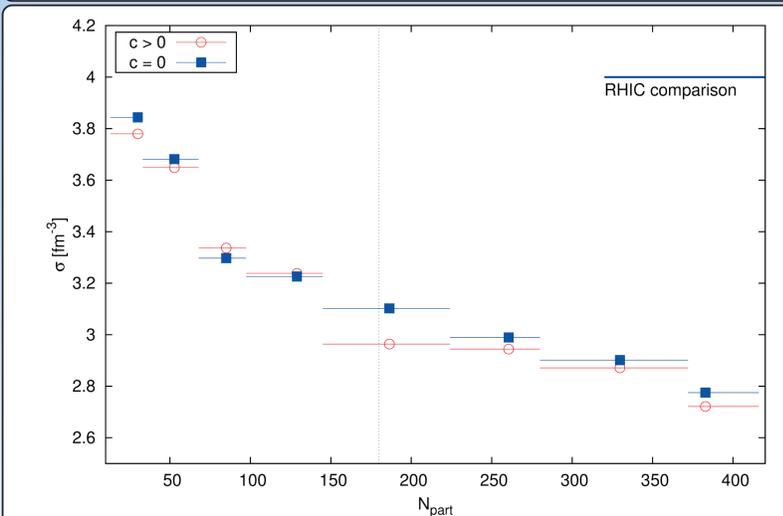
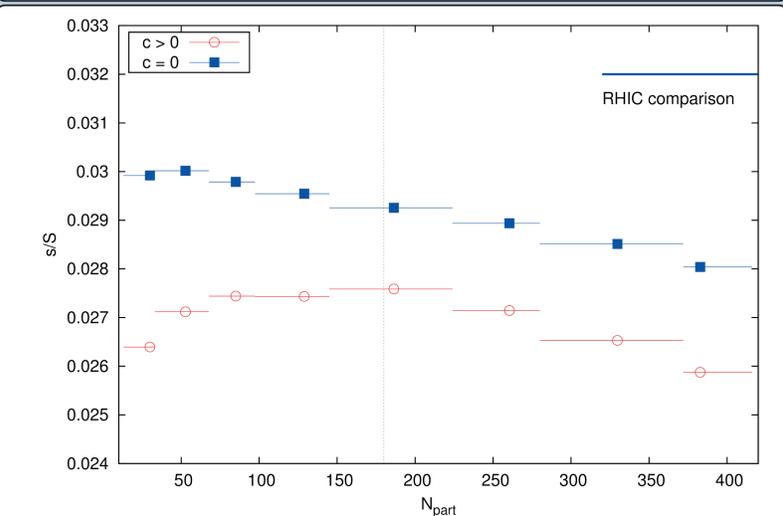
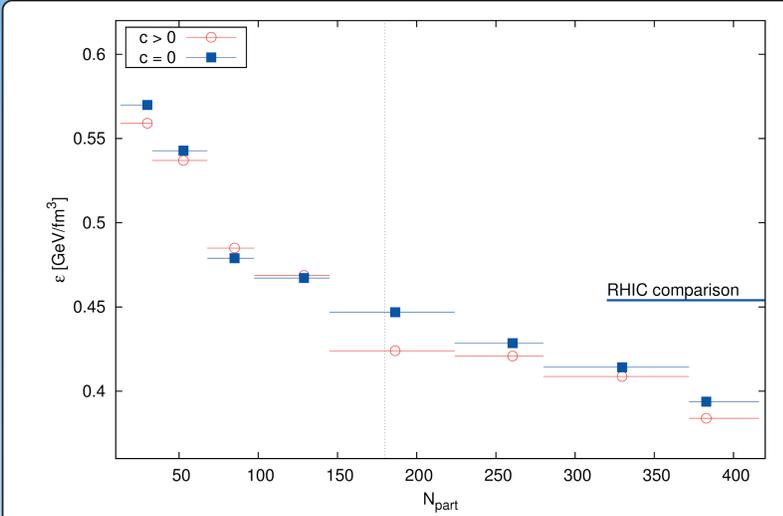
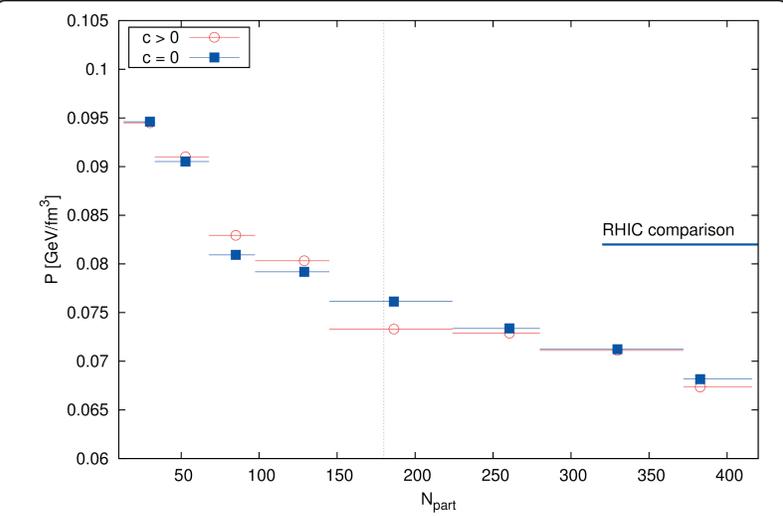


The ensemble of all produced hadrons carry information about the physical properties of the disintegrating QGP. For example the energy content is obtained evaluating the thermal (excluding flow) energy carried by all hadrons. Considering that many of the particles have not been measured, extrapolation of their yields have decisive impact on the result of the analysis of all 'bulk' properties. Using precise description of the available data employing maximum-parameter phase space model, we show that the bulk properties at RHIC and LHC are extremely similar (and do not differ significantly from high energy SPS results). This is demonstrating that bulk QGP at hadronization is governed by the same universal hadronization conditions characterized by a common domain of pressure, energy density and entropy density. These properties suggest the fast filamenting disintegration of the supercooled QGP state of matter.

Poster can be downloaded from: <http://www.physics.arizona.edu/~petran/files/QM2012-posters/poster3.pdf>



Bulk properties are calculated based on the soft hadron yields fitted and predicted using the SHARE [1] with CHARM fit (see poster 319, stand 300).

We show results based on charm contribution either $c=0$ fit (blue) or with- c (red), where the charm yield is fitted for peripheral collisions and estimated (see poster 319, stand 300) for central collisions. However, charm contribution is not included in thermal bulk properties.

The bulk properties show a smooth behavior as a function of centrality. On the right we show for comparison prior results obtained by the same method at RHIC [2,3].

Hadronization pressure P is decreasing as the system grows, exhibiting a plateau at $P=82$ MeV/fm³, the value preferred by RHIC fits, but decreasing by 15%. Similar qualitative behavior is seen for energy and entropy density.

Large system of hot QCD matter produced in central collisions expands very rapidly, overcools and then hadronizes, For the LHC that expansion continues further than is seen at RHIC reducing these quantities further.

Therefore the volume increase from RHIC to LHC is faster than the energy and entropy increase. This also indicates an increase in transverse energy.

Characteristic strangeness over entropy s/S does not quite reach (-12%) the RHIC value 0.032, either due to greater entropy S production by additional mechanisms, and/or strangeness reannihilation due to longer period of expansion seen in smaller value. The total yield of strangeness is still 3-4 times bigger than at RHIC for each centrality bin.

Charm and strangeness has a high probability of being bound together, around 20% of total charm is bound in a hadron that also contains a strange quark independent of centrality.

The total charm yield is fitted for $N_{part} < 180$, but only estimated above.

References:

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