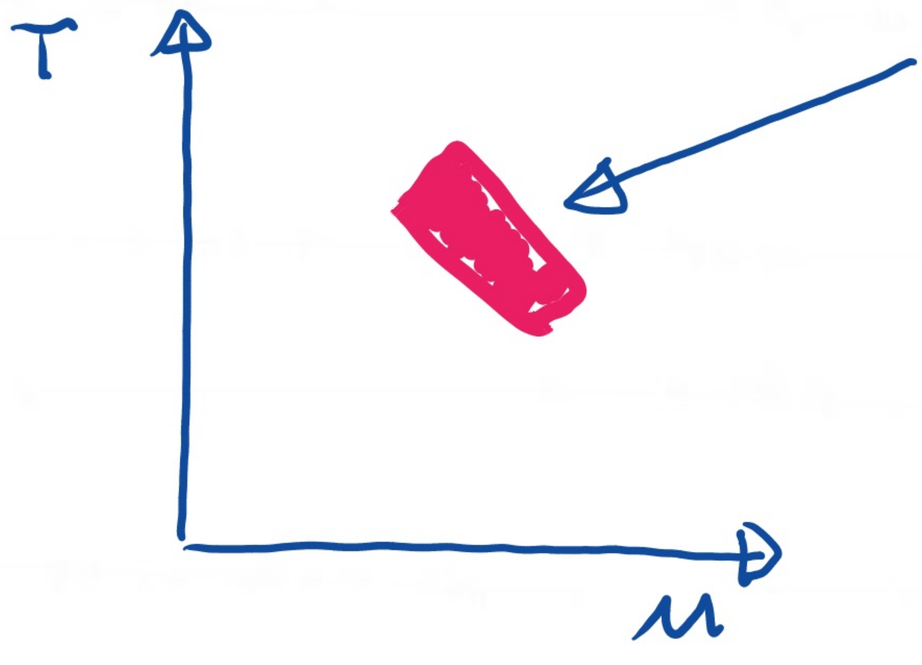
TOWARDS CRITICAL POINT EXCLUSION PLOT(S)

+ INCREASING NUMBER OF "CP-NEGATIVE" EXPERIMENTAL RESULTS

+ STEADY PROGRESS ON QUANTITATIVE CP-MODELS OF HEAVY ION COLLISIONS

THE CP-EXCLUSION PLOT



REGION IN WHICH A "FAVORITE" CP-MODEL DISAGREES WITH "CP-NEGATIVE" EXPERIMENTAL RESULTS

ESTIMATED BY VARYING T^E, μ^E IN THE CP-MODEL AND COMPARING ITS PREDICTIONS TO "CP-NEGATIVE" RESULTS

.. BUT PREDICTIONS OF CP-MODELS DEPEND ON MORE UNKNOWS THAN T_E, μ_E

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A POSSIBLE BACK-UP SOLUTION

"BASED ON CP-MODELS INTRODUCED A SIMPLE "PARAMETRIZATION" OF THEIR PREDICTIONS, FOR EXAMPLE:

CP-PARAM = BACKGROUND (MIXED EVENTS, SMASH, UrQMD, ..) + SIGNAL (CORRELATION IN PARTICLE MOMENTA, ..)

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EXCLUSION PLOTS IN PARAMETERS OF CP-PARAM FOR A GIVEN REACTION / RESULTS

EXCLUSION PLOTS IN PARAMETERS OF CP-PARAM FOR A GIVEN REACTION / RESULTS

=> TOOL TO QUANTIFY / COMPARE SIGNIFICANCE OF "CP-NEGATIVE" RESULTS FOR THE CP-SEARCH

FOR EXAMPLE IT SHOULD ALLOW TO ANSWER THE QUESTION:

"WHAT IS BETTER: SECOND OR TWENTY SECOND MOMENT OF MULTIPLICITY DISTRIBUTION ?"

A FIRST EXAMPLE FROM TOBIASZ (NAGI/SHINE) SLIDES:

CP-PARAM

Simple power-law model

Comparison with simple power-law model

A simple model that generates momentum of particles for a given number of events with a given multiplicity distribution.

It has two main parameters:

- ratio of correlated to uncorrelated particles,
- power-law exponent.

Uncorrelated particles (background)

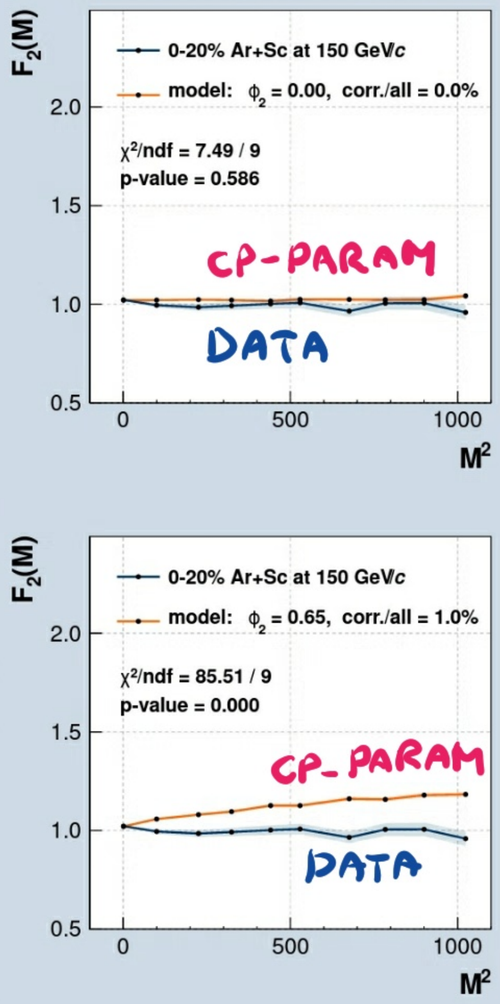
$$\rho_B(p_T) = p_T \cdot e^{-6p_T}$$

Correlated pairs (signal)

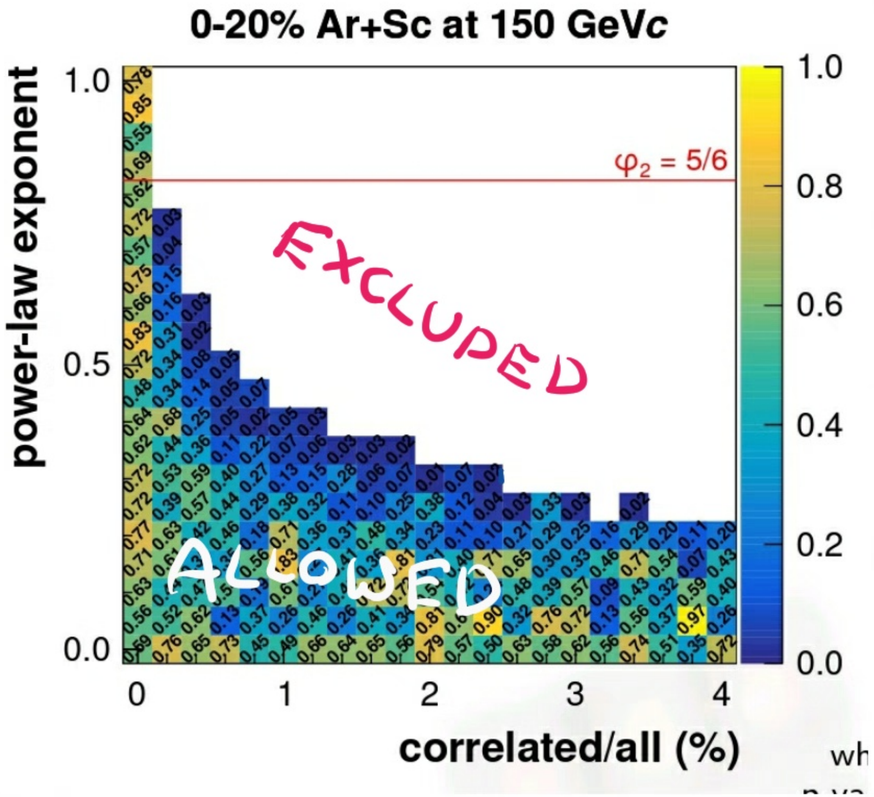
$$\rho_S(p_{T,1}, p_{T,2}) = \rho_B(p_{T,1}) \cdot \rho_B(p_{T,2}) \cdot \left[|\Delta p_x|^{\phi} + \epsilon\right]^{-1} \cdot \left[|\Delta p_y|^{\phi} + \epsilon\right]^{-1}$$

CP-PARAM VS DATA

M = 1 ... 32



EXCLUSION PLOT FOR PARAMETERS OF CP-PARAM AND THE DATA



1. WOULD BE GREAT TO HAVE SEVERAL "STANDARD" CP-PARAMS (← HELP FROM THEORY IS NEEDED) AND TEST SENSITIVITY OF DIFFERENT RESULTS TO CP

2. THEN SELECT THE MOST SENSITIVE MEASURMENTS AND CALCULATE EXCLUSION PLOTS FOR PARAMETERS OF CP-PARAMS AND REACTIONS