

STAR and PHENIX Luminosity corrections

Signals : ZDC coincidence w/o dead time

Corrections: “Standard” (for these plots)

Cross sections (from vernier scan 17263):

2.3 mbarn (PHENIX)

2.5 mbarn (STAR)

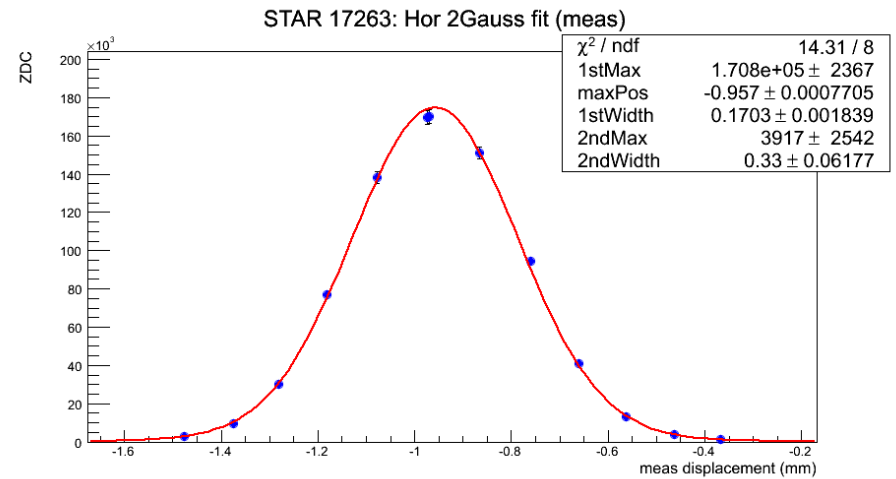
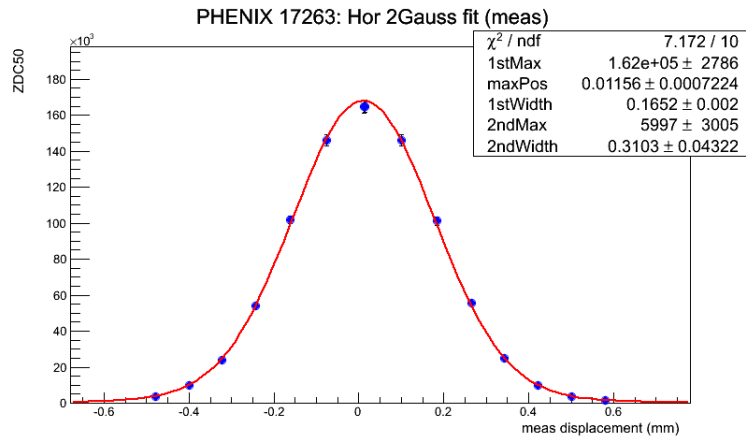
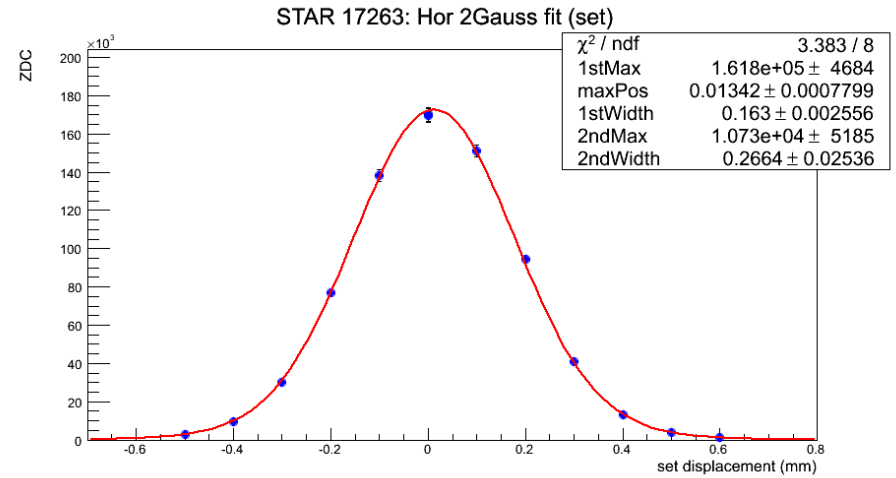
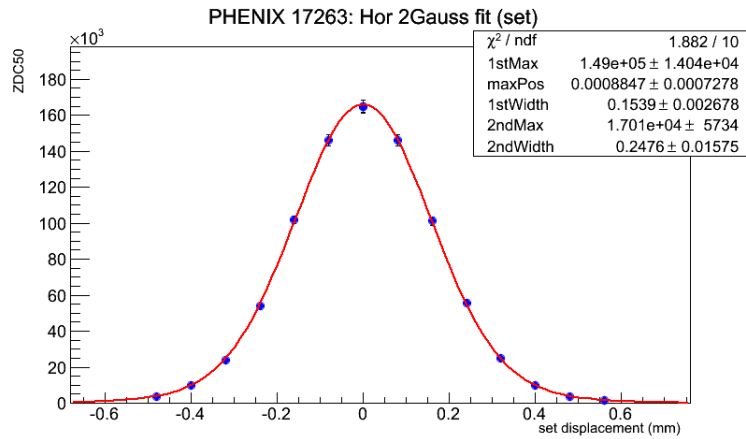
Luminosity (@17263 vs):

$7.19 \cdot 10^{31} \text{ cm}^{-1} \text{ s}^{-1}$ (PHENIX)

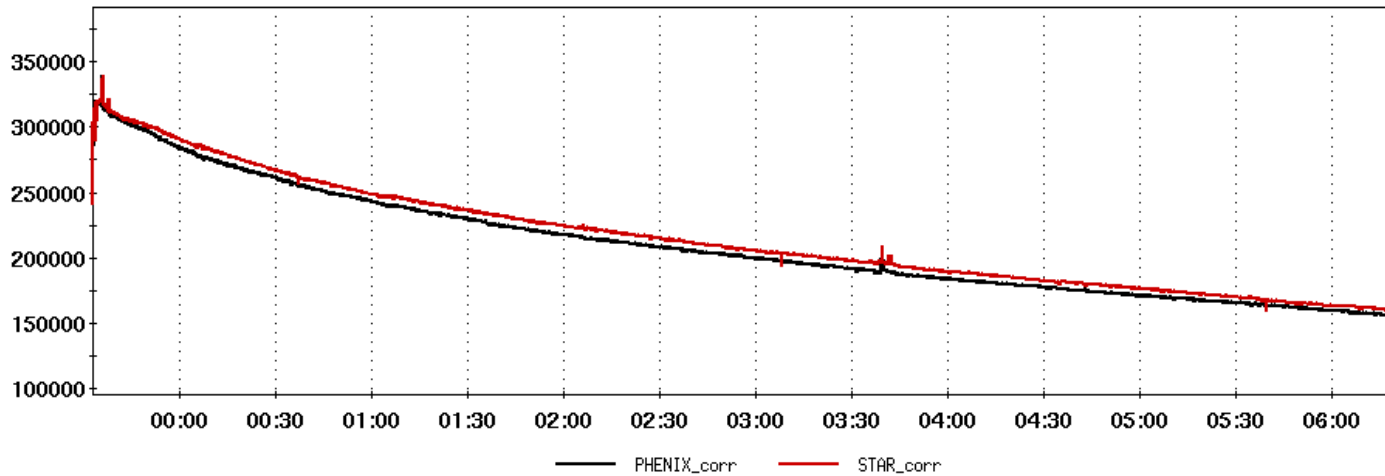
$6.87 \cdot 10^{31} \text{ cm}^{-1} \text{ s}^{-1}$ (STAR)

Ratio: 0.955 ($102/107 = 0.953$)

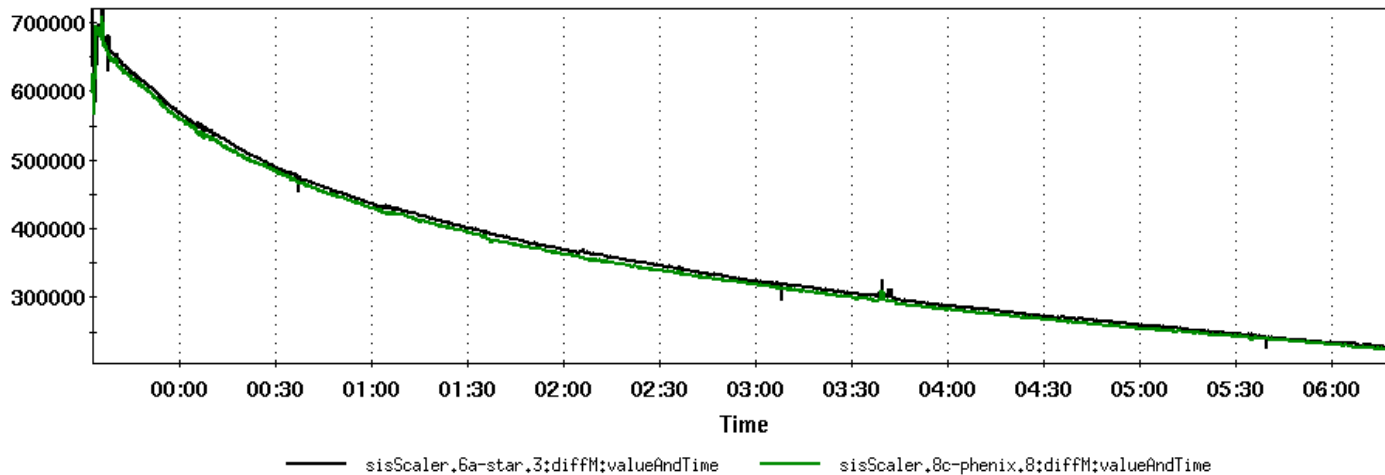
Data from vernier scan 17263



Using “Standard” correction on ZDC coincidence Signals



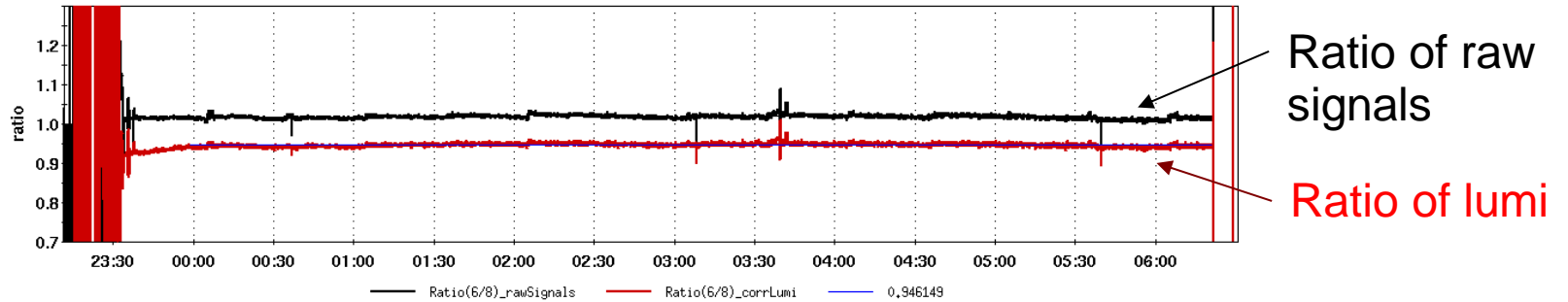
corrected



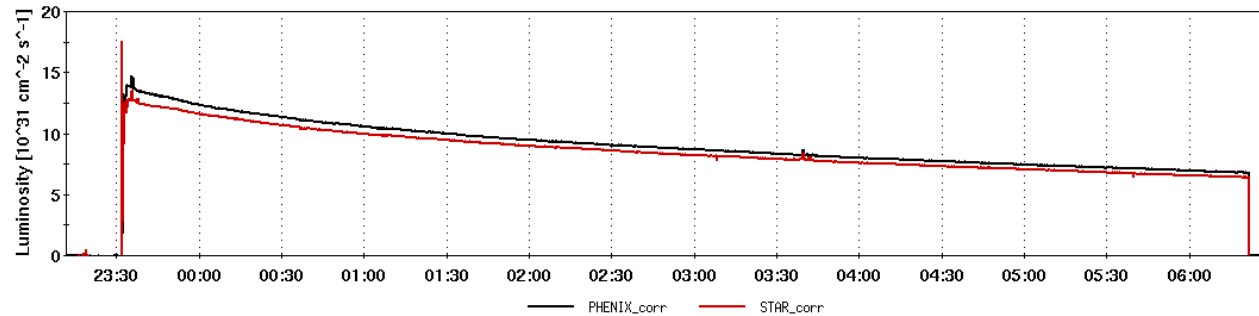
uncorrected

Signals w/o deadtime!

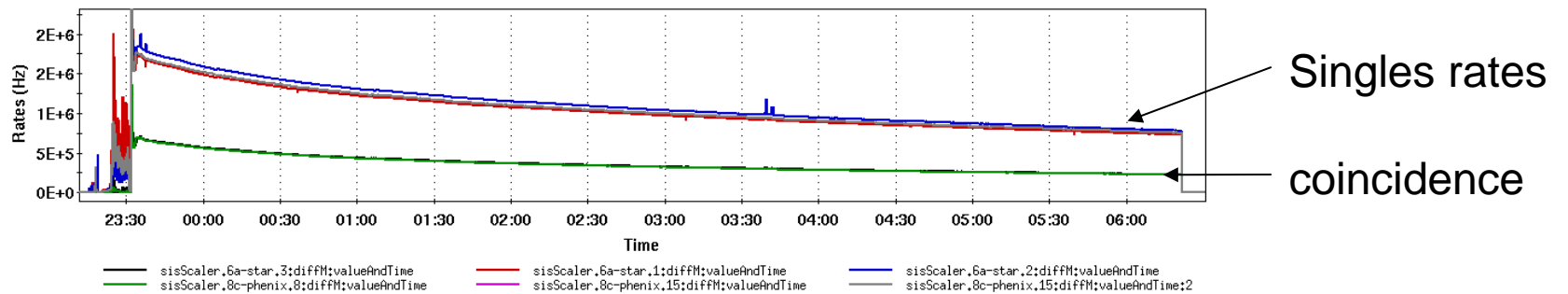
Instantaneous Luminosity #17306



Fully corrected Luminosity



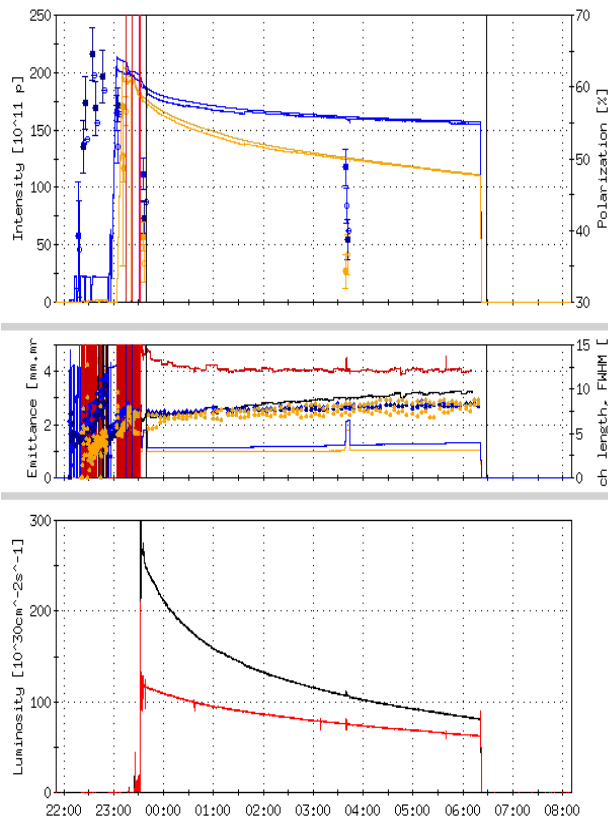
Raw signals



Problem: only one singles rate available from PHENIX (w/o dead time)

Online Monitoring (StoreAnalysis)

- Bottom plot should show Lumi from ZDC coincidence, “Standard”-corrected



The screenshot shows the StoreAnalysis control interface. At the top, there are fields for 'Fill' (17306), 'Update', 'Species' (pppp), and 'Run' (run_fy13). Below this is the 'Beam Parameters' section with 'Pattern' (109x109) and 'gamma' (271.635). The main section is divided into 'Parameters', 'Display', and 'Fit' tabs. Under 'Parameters', there are two columns for 'PHENIX' and 'STAR' with various input fields: 'Number collisions' (107, 102), 'beta* [m]' (0.65, 0.65), 'sMax [m]' (0.30, 2.00), and 'sigma [mb]' (2.300, 2.500). There are also 'Single Correction' buttons for 'All' and 'All'. An 'Update Display' button is located at the bottom.

- Values for STAR are fully consistent with the values shown in the previous plot, PHENIX looks uncorrected -> problem in the configuration/code, needs to be fixed (work in progress)

Confirmation with LumiCalc (offline book-keeping) also in progress