2x2 cluster method and isolation cut

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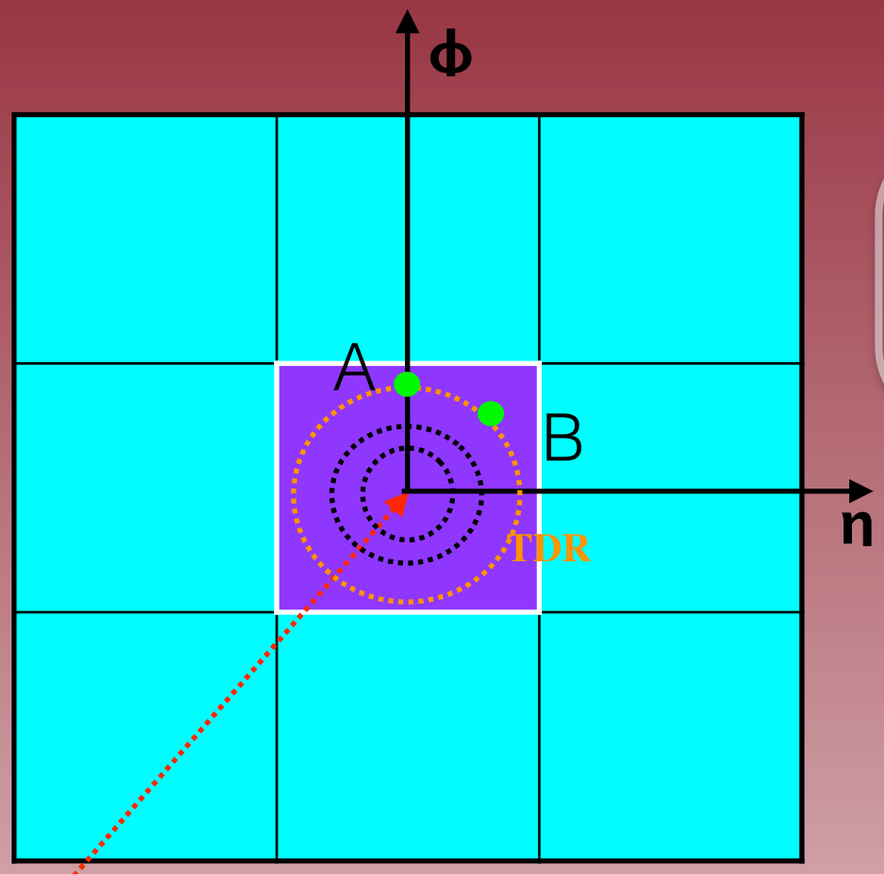
2x2 Cluster Method : Motivation : Shower leakage and MC Based Correction

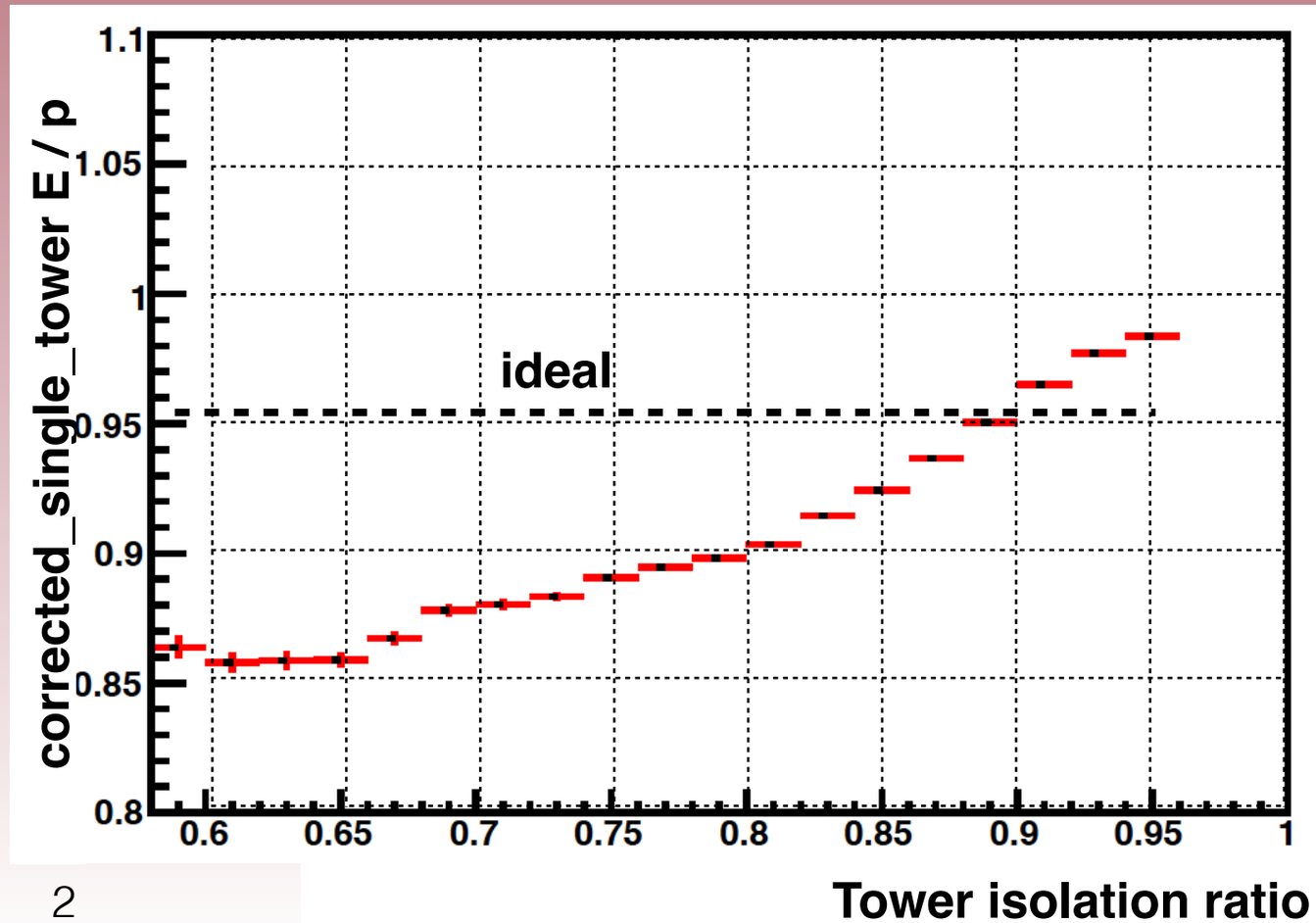


2x2 cluster Method

$$\text{Tower isolation ratio} = \frac{\text{uncorrected center tower energy}}{\text{Energy of 3x3 cluster}}$$

- Single-tower method uses same correction for both points A and B. Here: $B_{Leakage} < A_{Leakage}$
- Expect in the ideal case a flat E / p behavior when plotted against the tower isolation ratio.
- Isolation criteria is not appropriate for tower method.

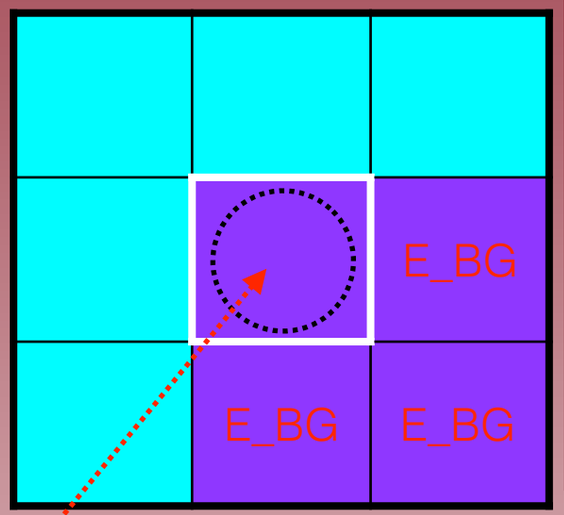
corrected single tower E / p Vs Tower isolation ratio

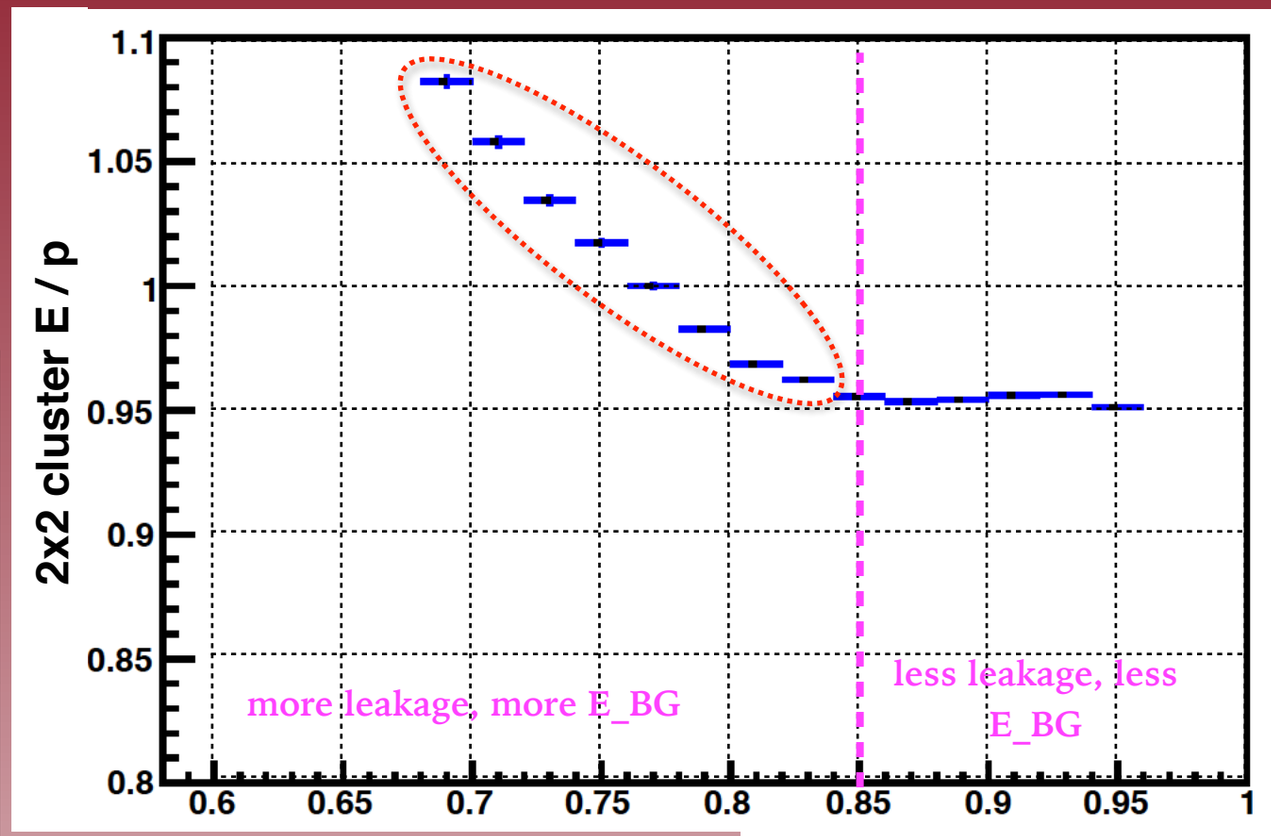


2x2 cluster method and isolation cut

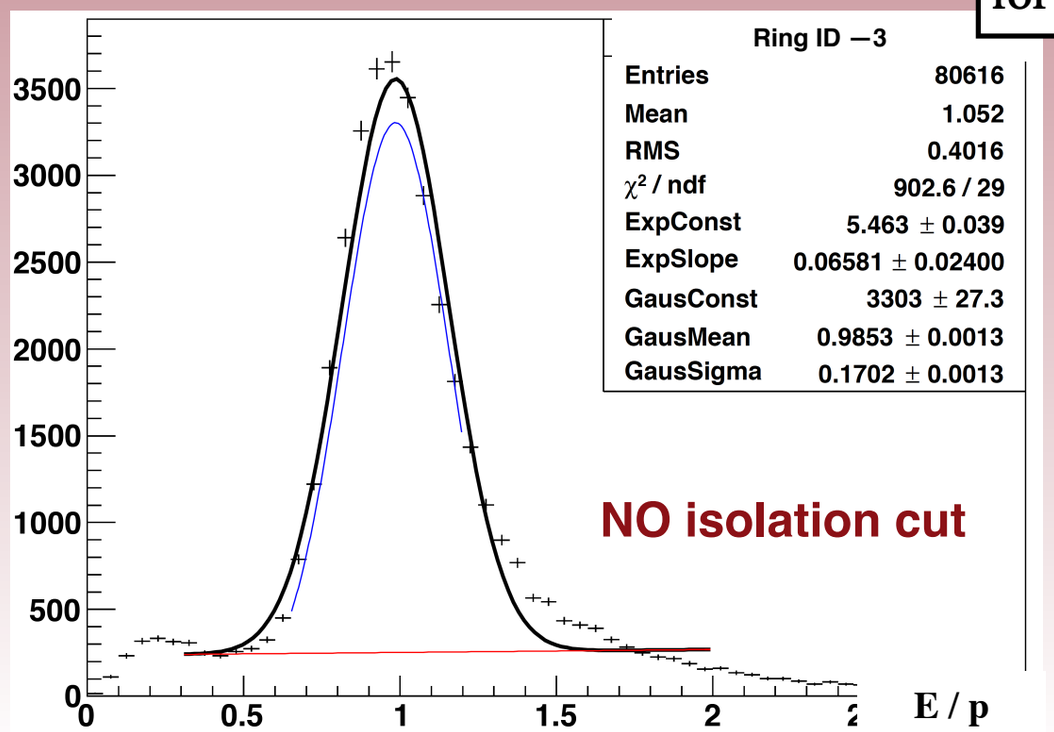
$$\text{Tower isolation ratio} = \frac{\text{uncorrected center tower energy}}{\text{Energy of 3x3 cluster}}$$

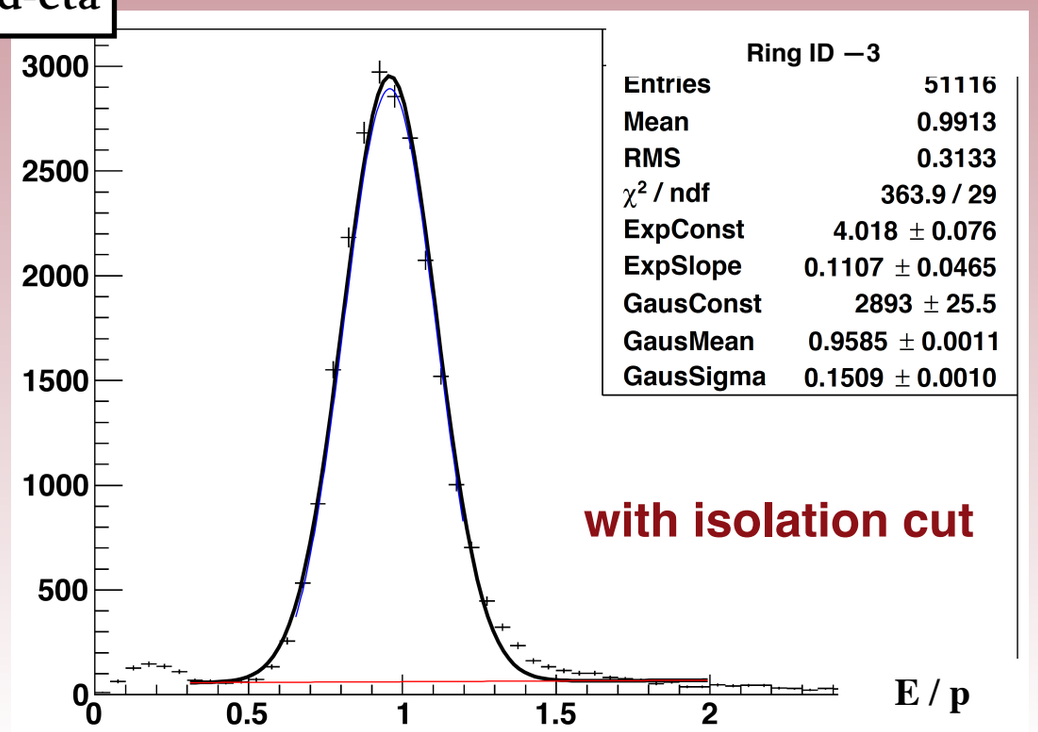
- Center tower -> E_{Max} in 3x3 where track hits.
- No other tracks in 3x3.
- Select 2x2 cluster with maximum energy.



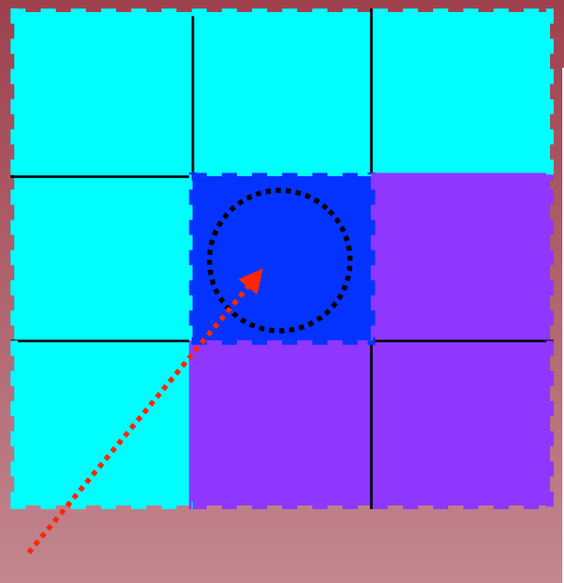


forward-eta

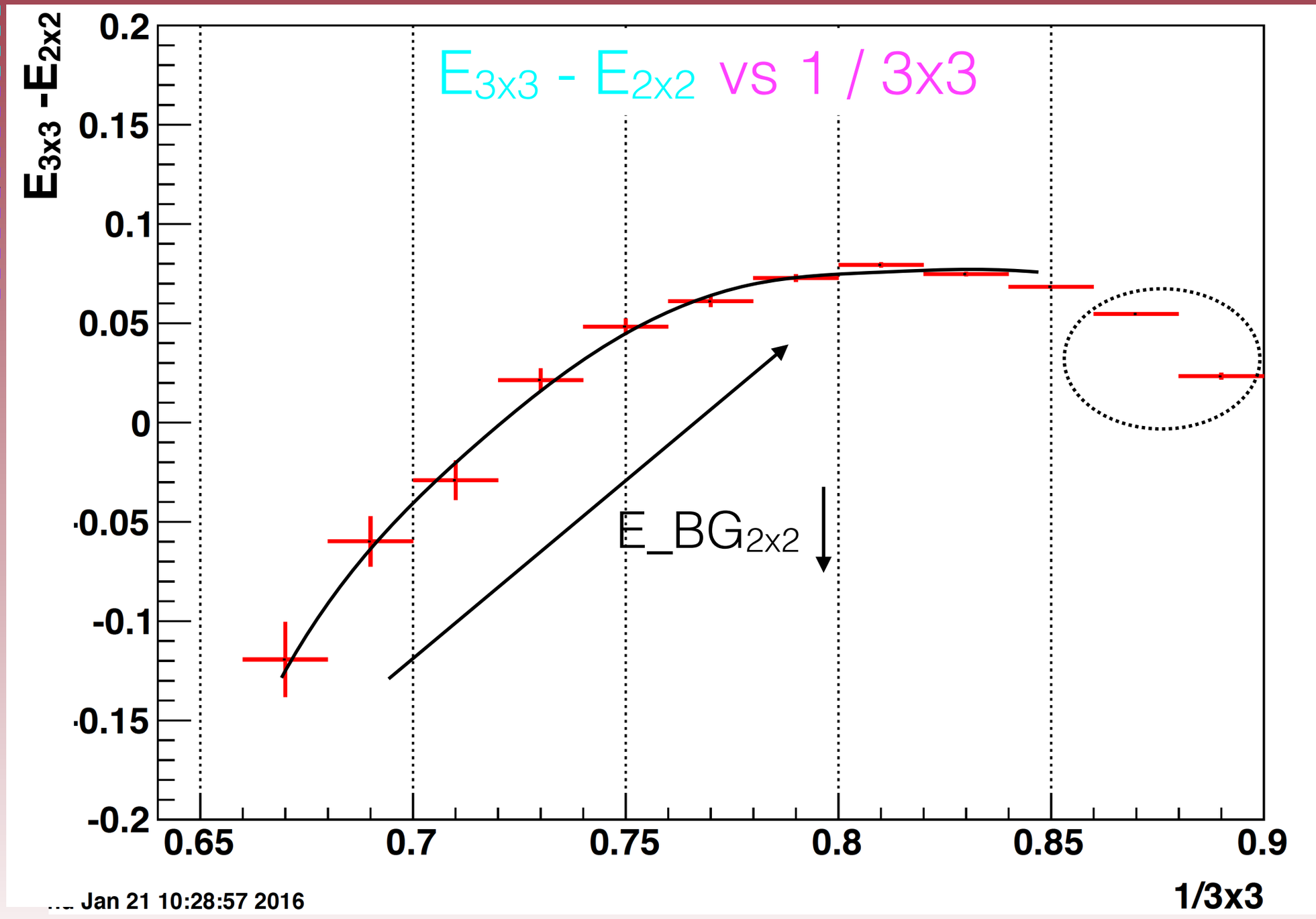




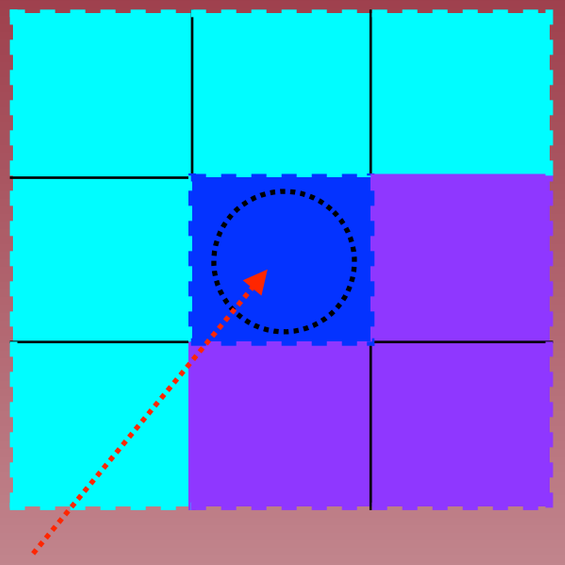
E_{3x3} - E_{2x2} vs 1 / 3x3

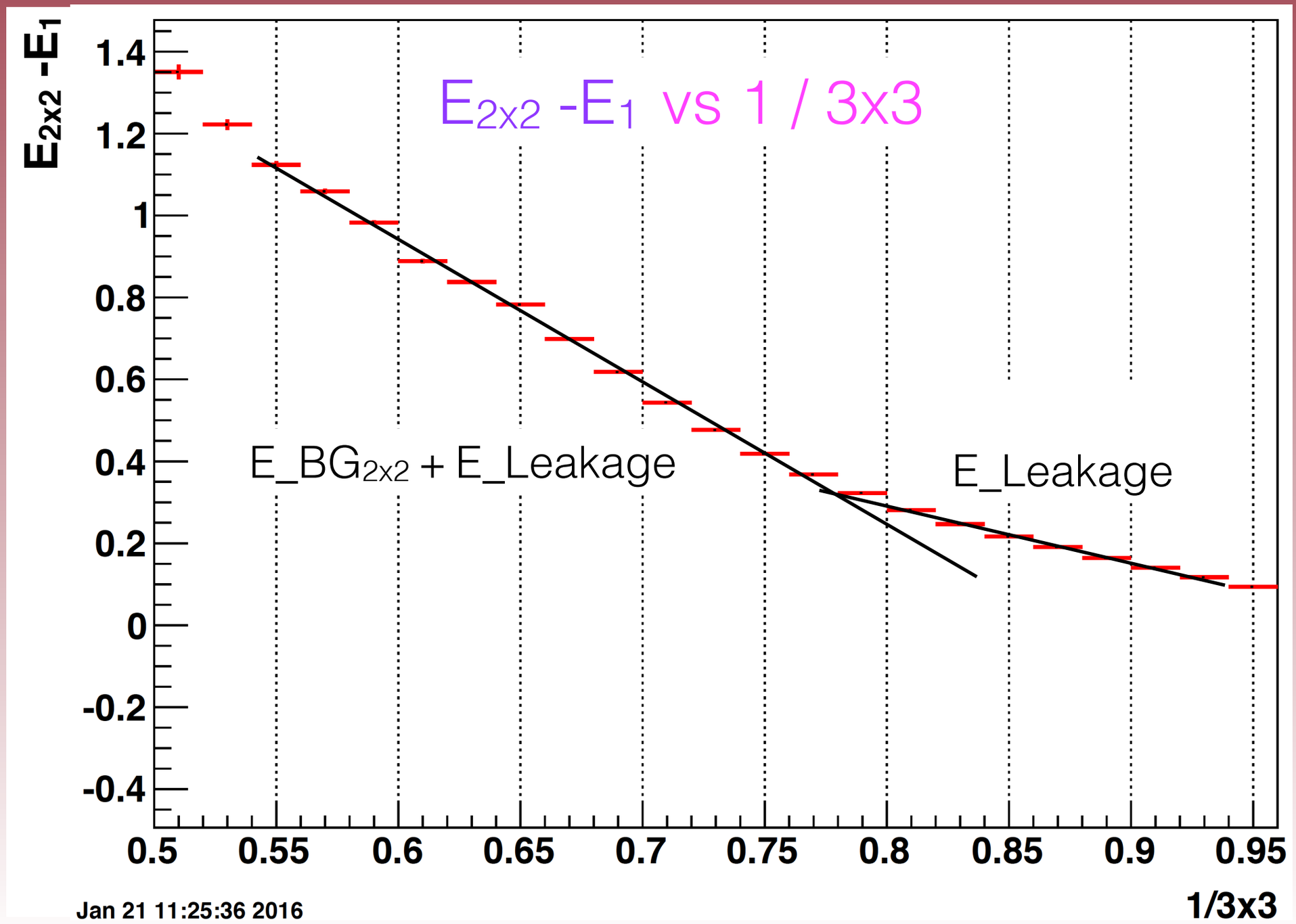


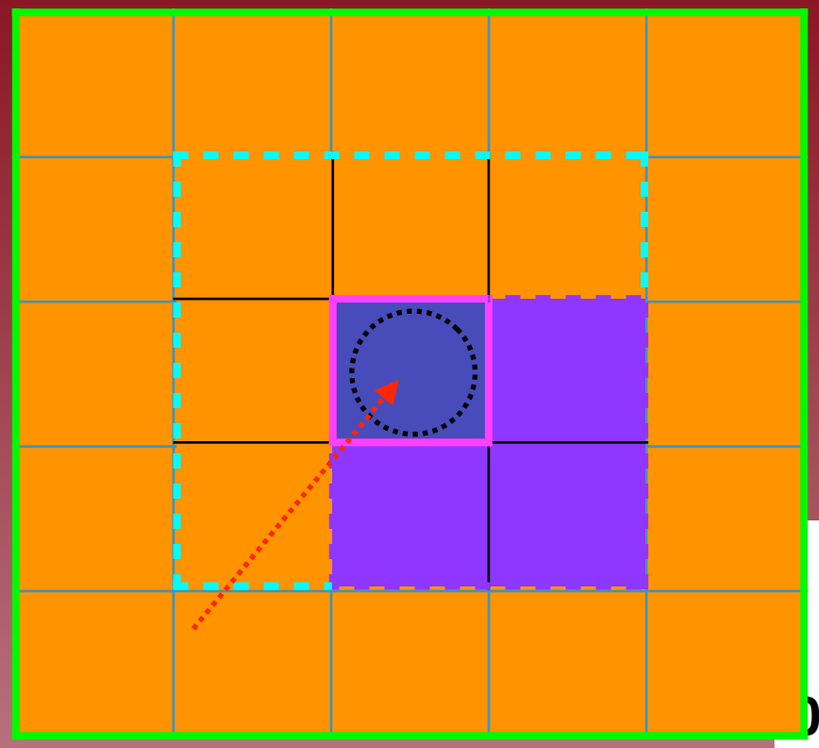
- E_BG_{2x2} decreases more than E_BG_{3x3} which increases E_{3x3} - E_{2x2} .
- And once the residual BG effect saturated E_{3x3} - E_{2x2} shows stable value.



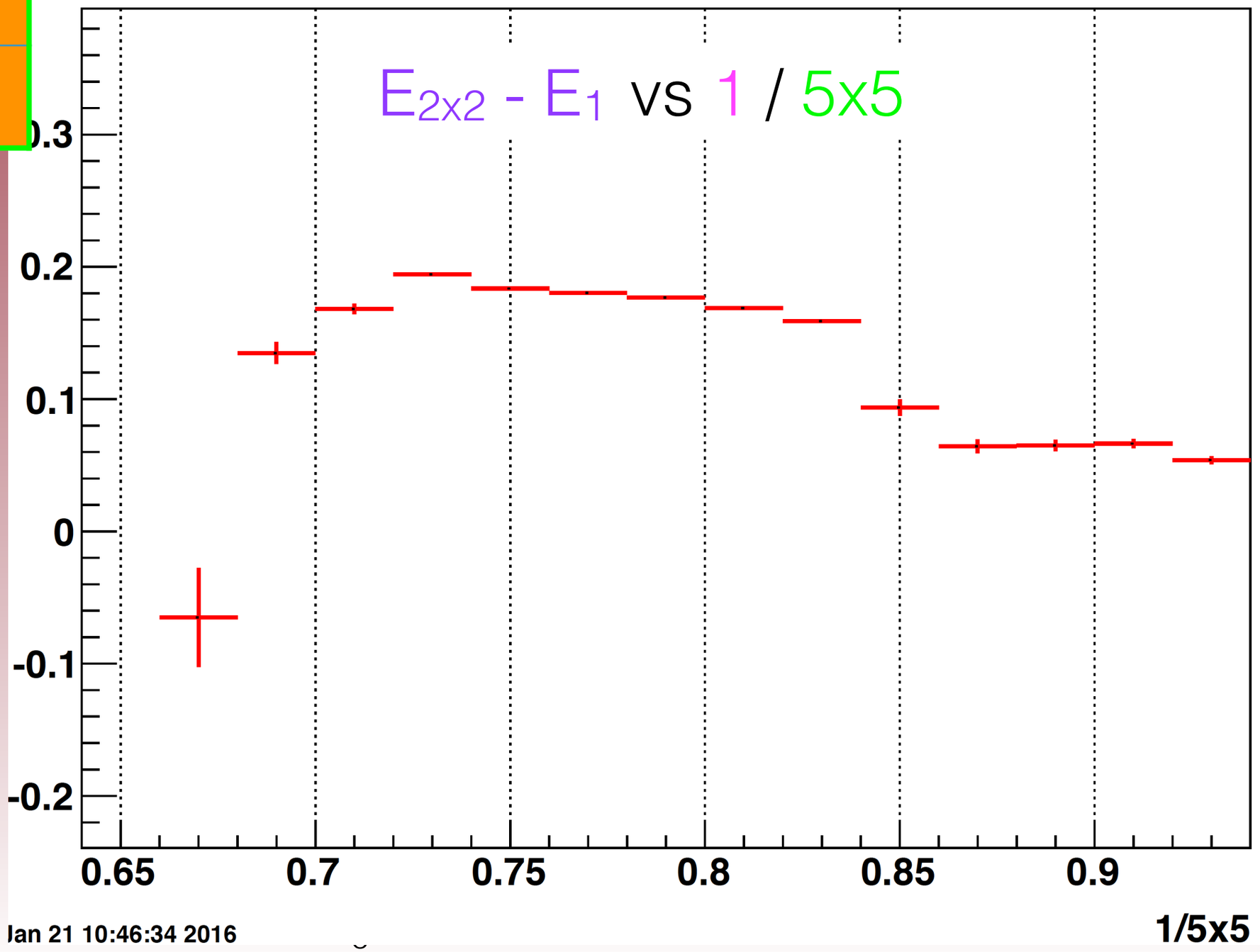
E_{2x2} -E_1 vs 1 / 3x3

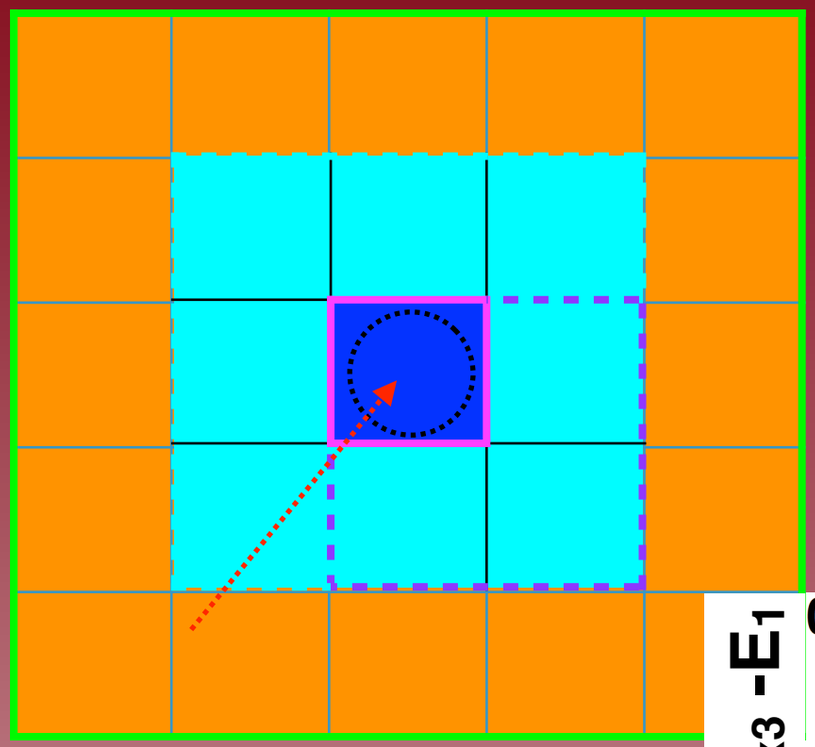




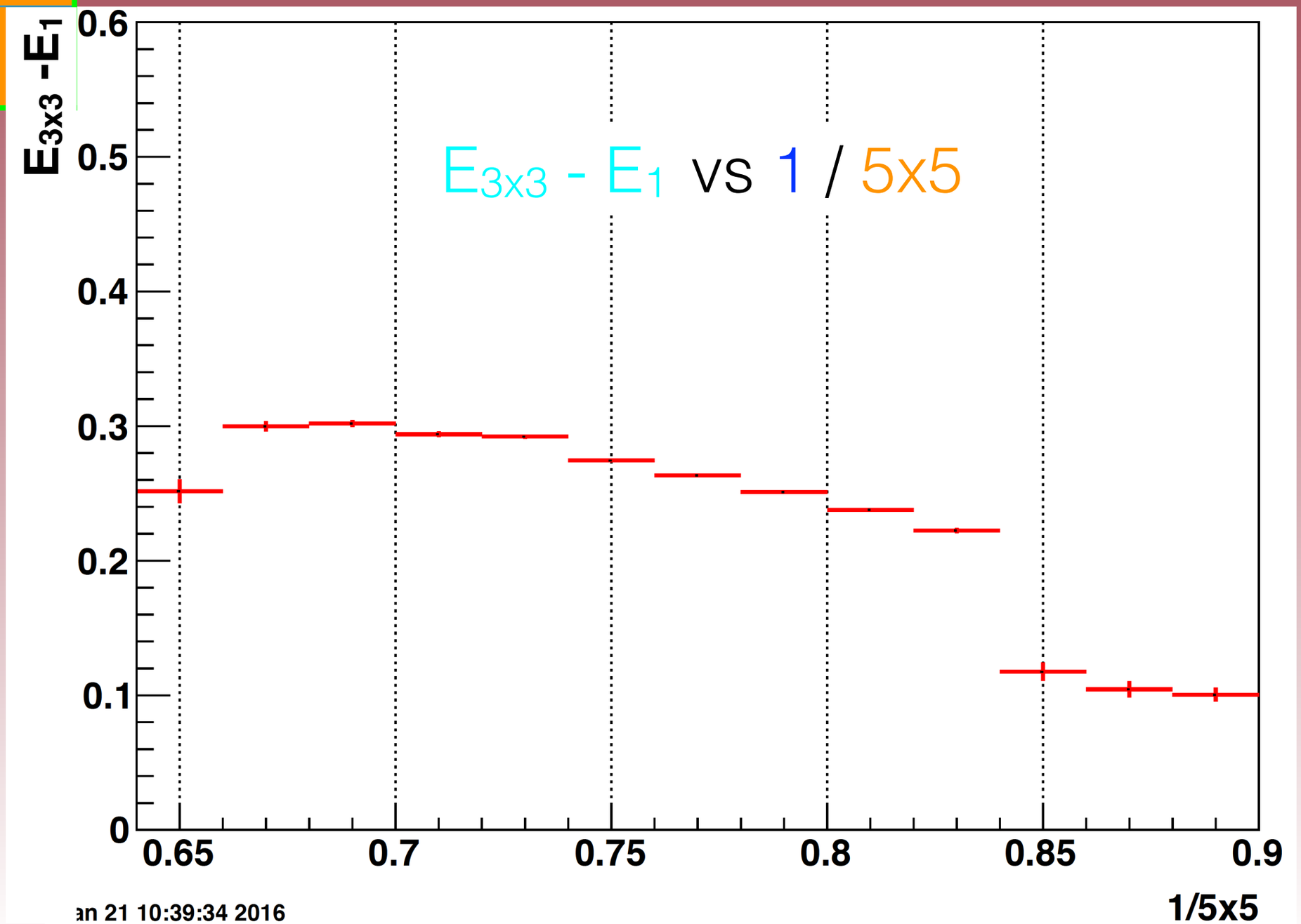


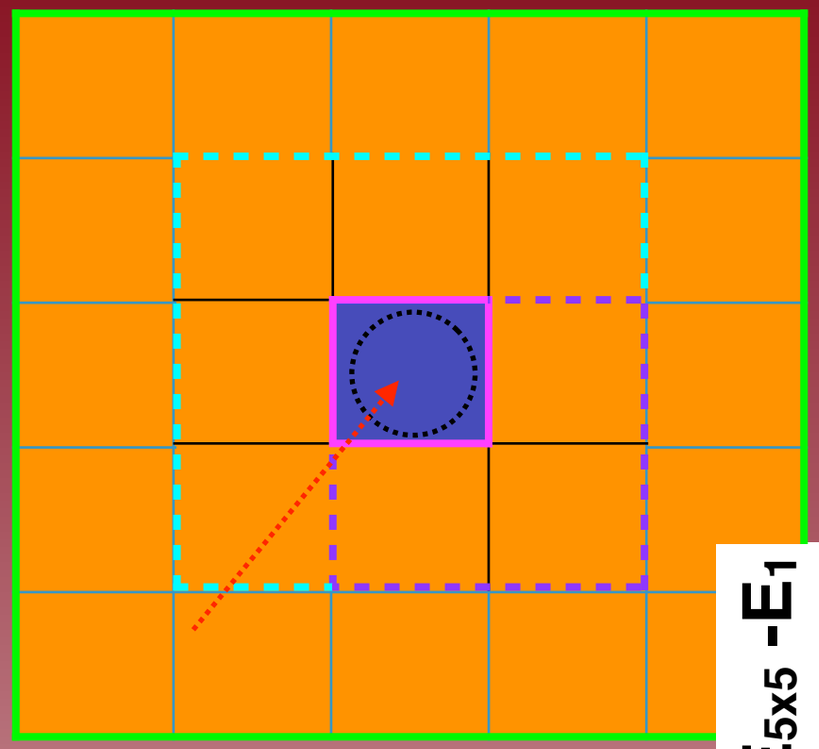
E_{2x2} - E_1 vs 1 / 5x5



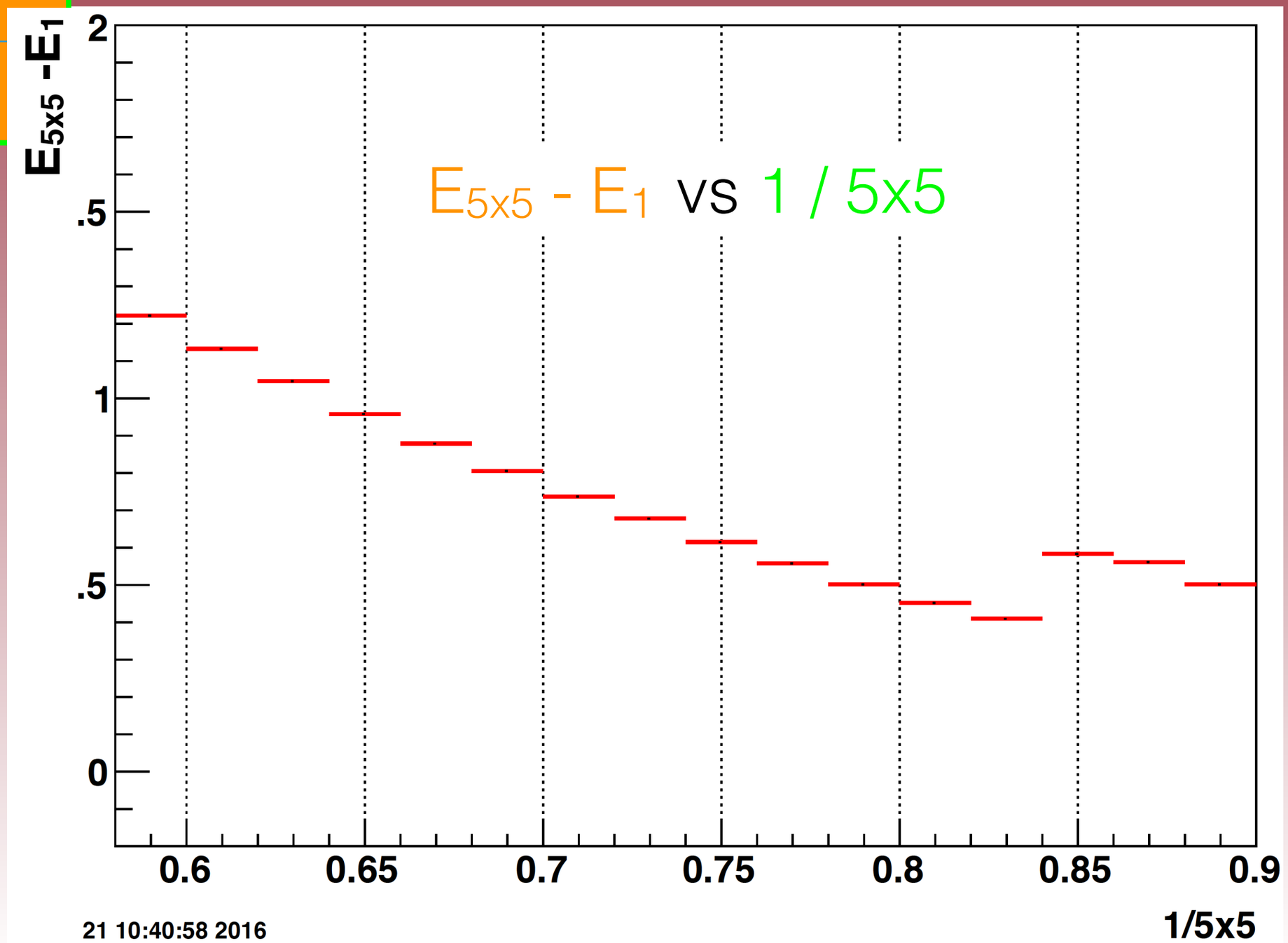


E_{3x3} - E_1 vs 1 / 5x5

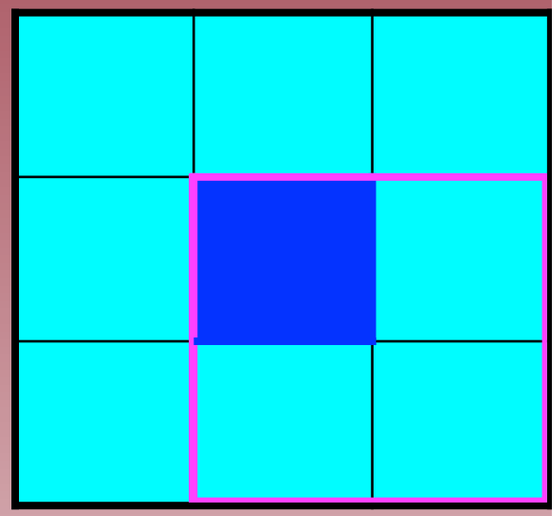


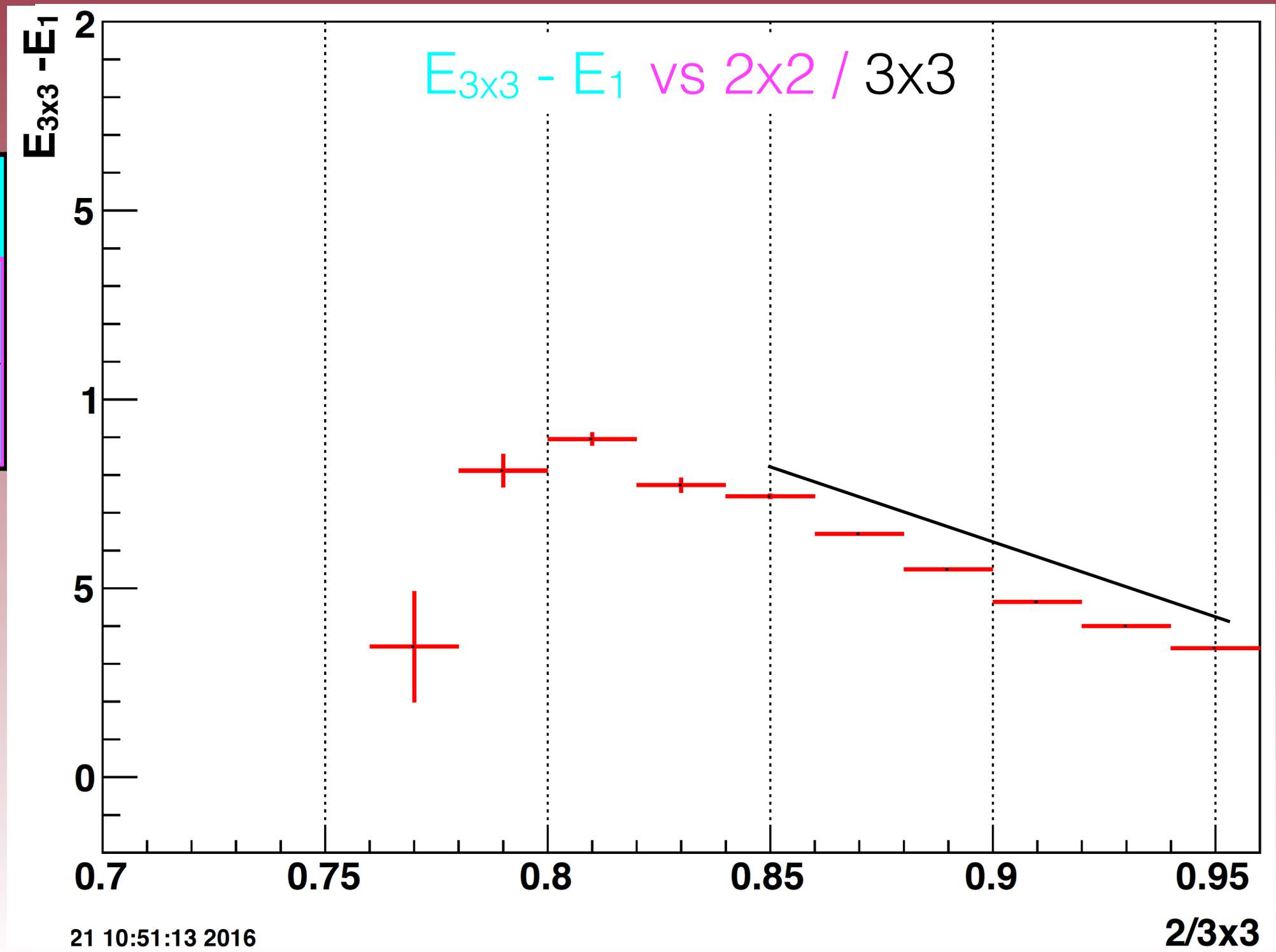


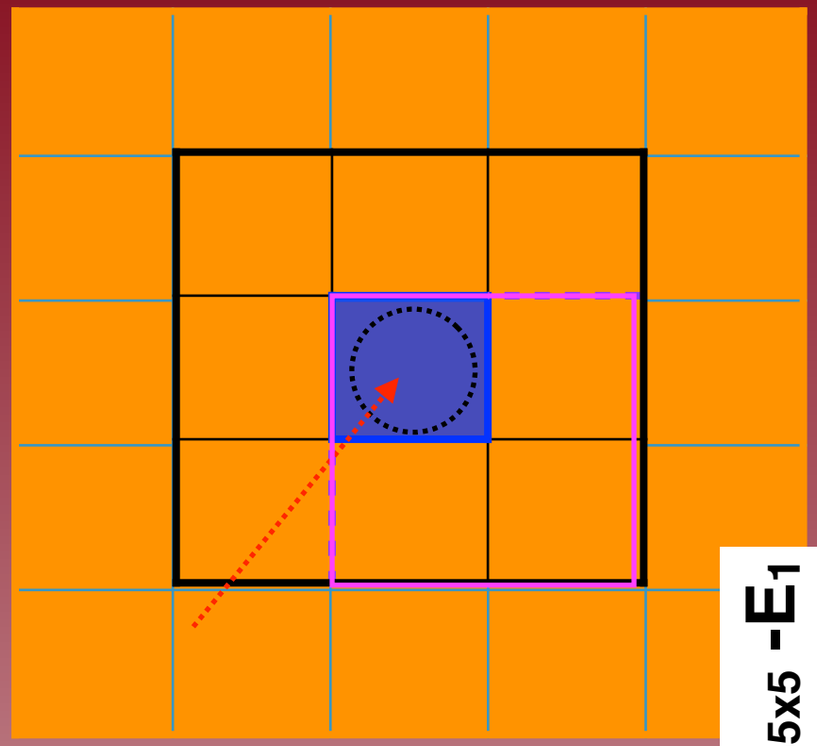
E_{5x5} - E_1 vs 1 / 5x5



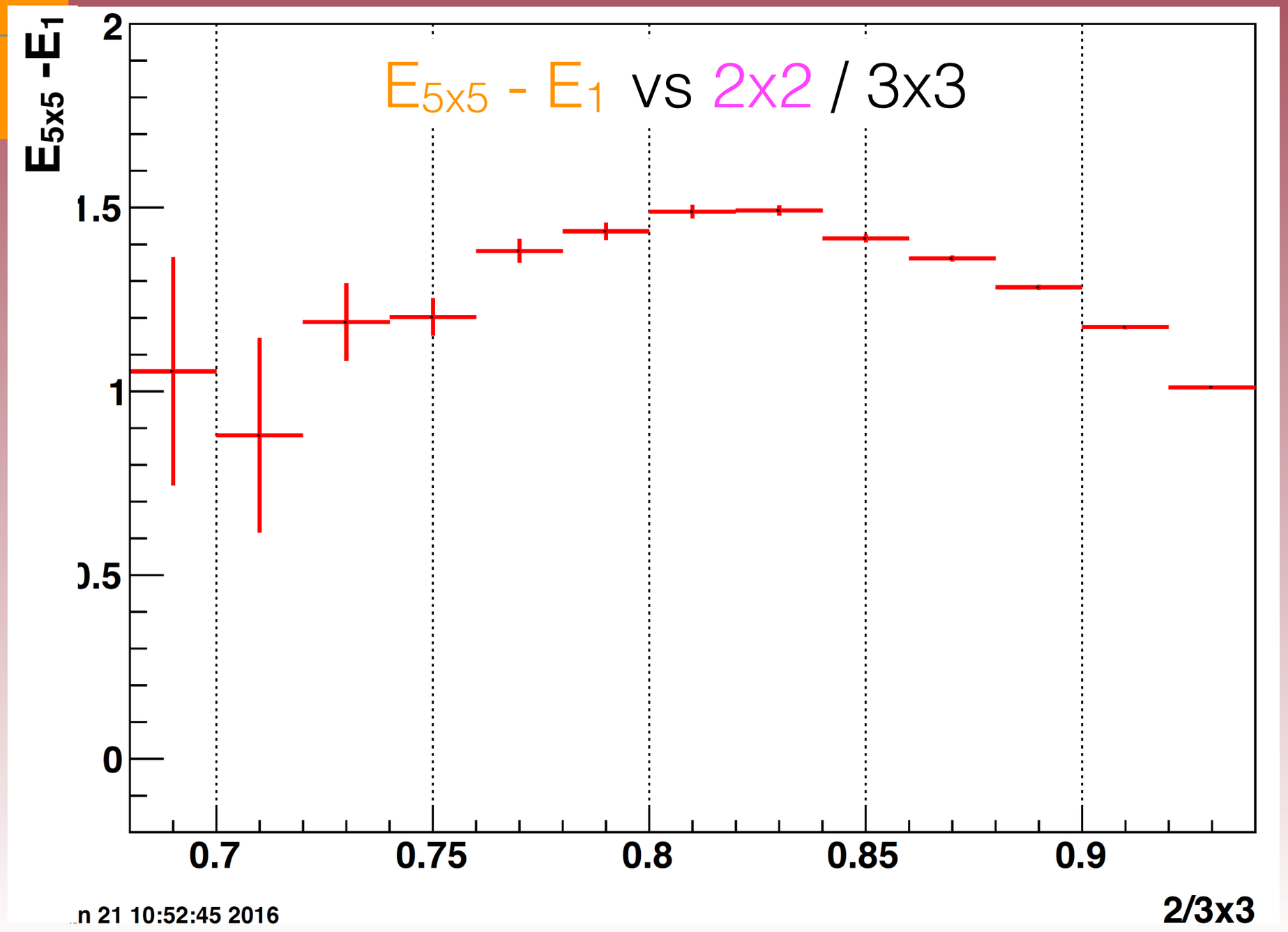
$E_{3x3} - E_1$ vs 2x2 / 3x3

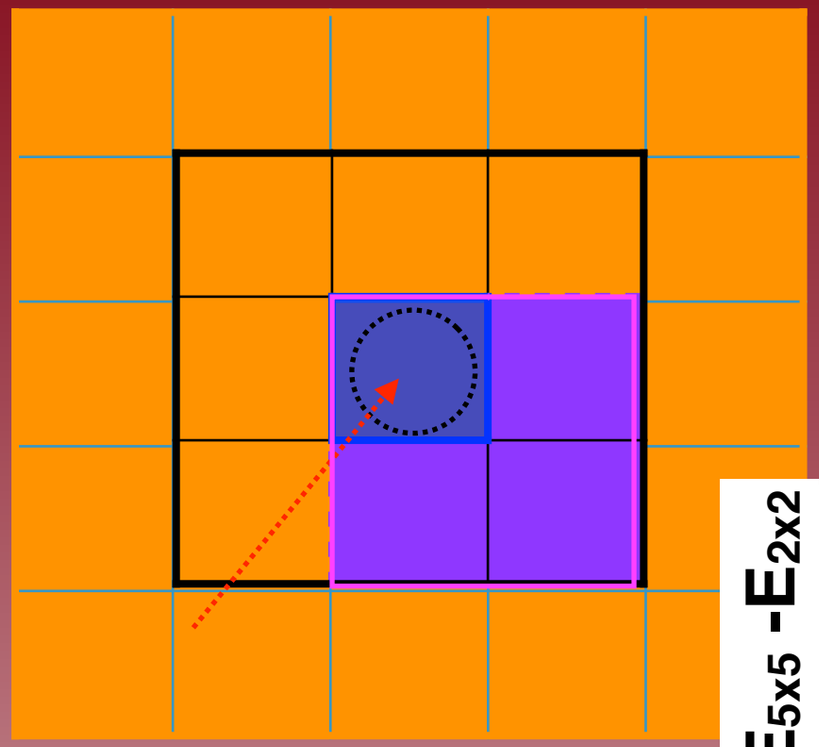




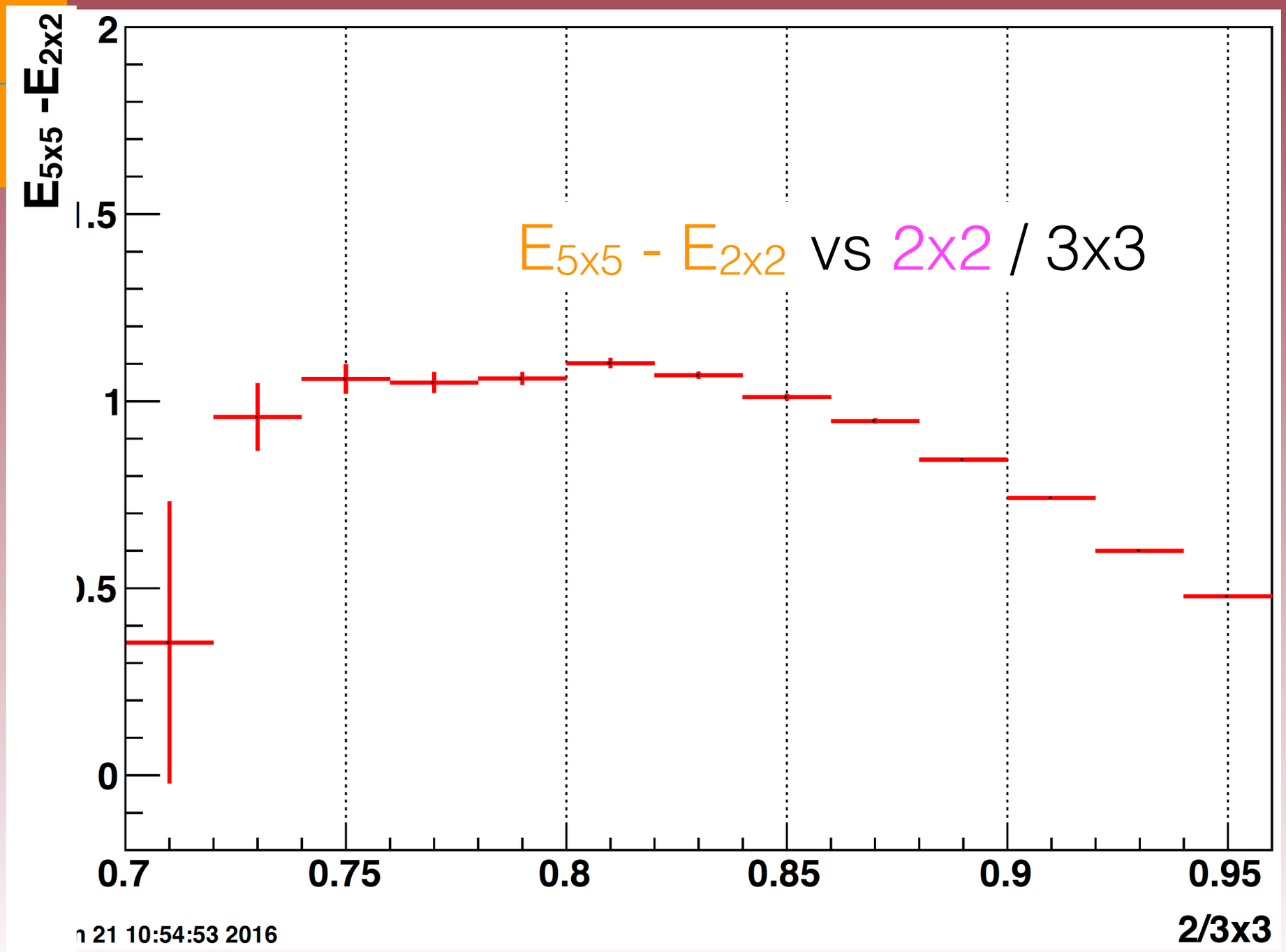


E_{5x5} - E_1 vs 2x2 / 3x3





E_{5x5} - E_{2x2} vs 2x2 / 3x3



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