

# Identical charged pion femtoscopy correlations for 7.7 and 11.5 GeV with vHLLE+UrQMD

L. Malinina (SINP MSU-JINR),  
A. Romanova (MSU), G. Romanenko, K. Mikhaylov (ITEP-JINR)

18.06.2020

# Details of Analysis $\pi\pi$ 7.7 & 11.5 GeV

- **centrality bins:**

	7.7 GeV	11.5 GeV
3.3fm -- 0-5%	2 000 000 ev	1 000 000 ev
4.7fm – 5-10%	2 000 000 ev	1 000 000 ev
6.6fm –10-20%	2 000 000 ev	1 000 000 ev
- **8  $k_T$  bins for pions[GeV/c]:** [0.15,0.25], [0.25,0.35], [0.35,0.45], [0.45,0.55], [0.55,0.65], [0.65,0.75],[0.75,0.85],[0.85,0.95] GeV/c

Monte Carlo: vHLLE+UrQMD

Hydro: /zfs/store7.hydra.local/pbatyuk/mcDst/vHLLE\_UrQMD/AuAu/

- **Event selection**

- At least one particle must be reconstructed as a pion (Kch)

- **Single track cuts**

$|\eta| < 1.0$  and  $0.15 < p_T < 2.8$  GeV/c

- **QS weights only**

- **Fitting procedures:**

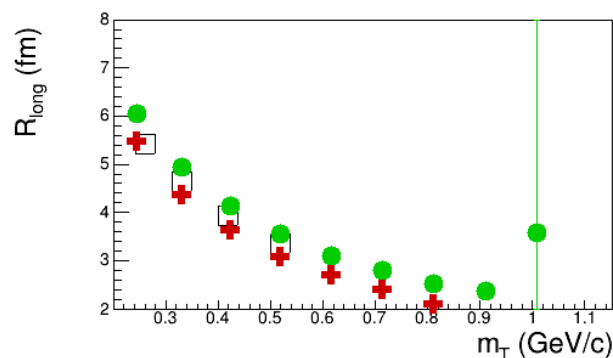
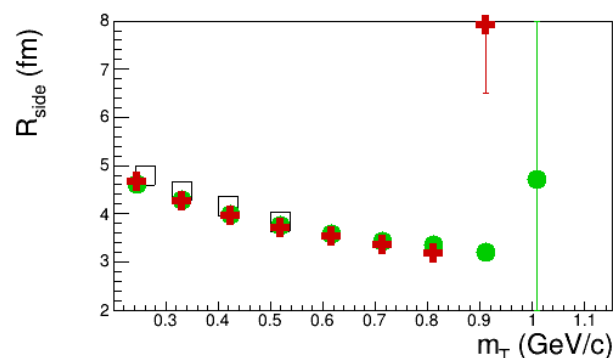
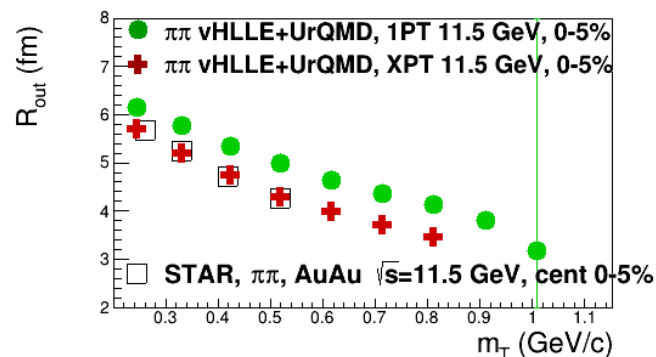
$$C(q_{out}, q_{side}, q_{long}) = 1 + \lambda \exp(-R_{out}^2 q_{out}^2 - R_{side}^2 q_{side}^2 - R_{long}^2 q_{long}^2)$$

$$C(q_{inv}) = 1 + \lambda \exp(-R^2 q_{inv}^2)$$

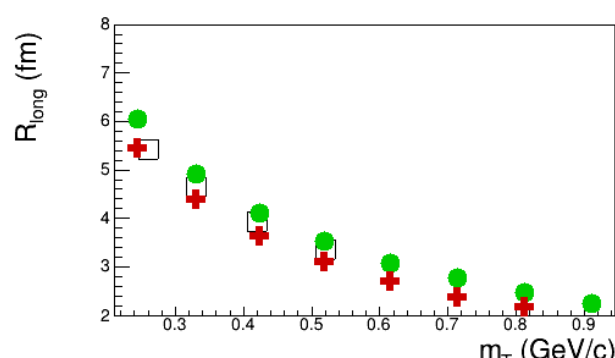
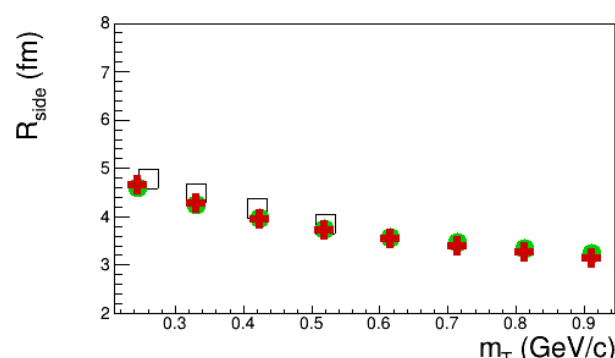
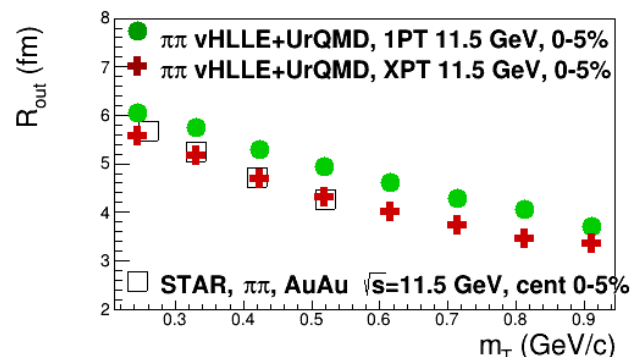
# Comparison of new FEMTO MPD / old: pions $R(m_T)$ vHLLE+UrQMD

- AuAu , sqrt(sNN) = 11.5 GeV/c, 0-5%

Old



New



Some variations

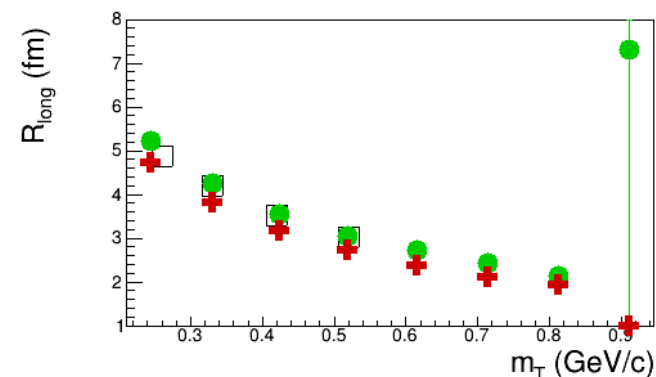
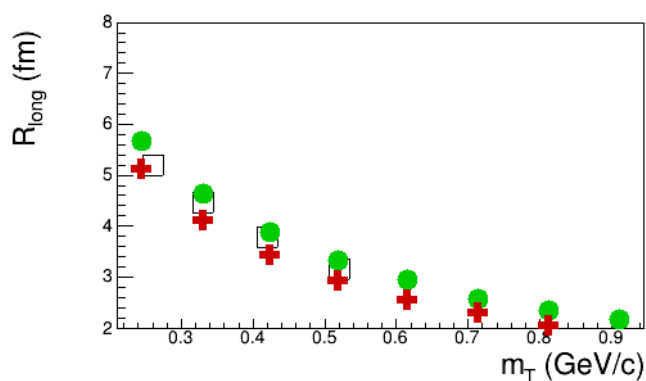
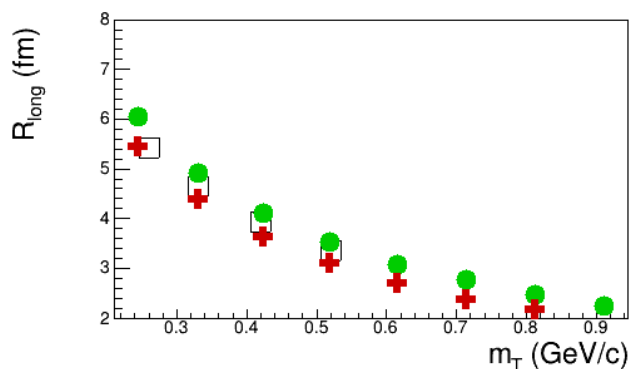
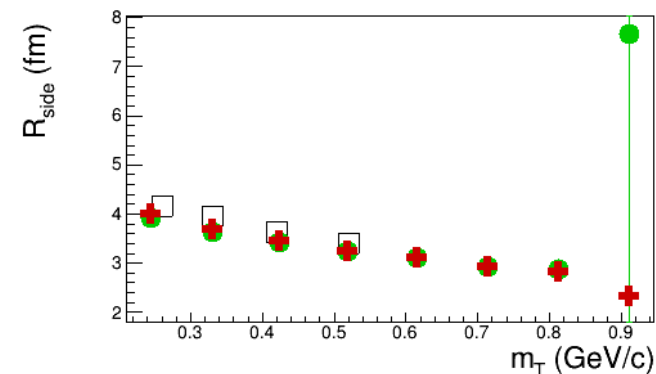
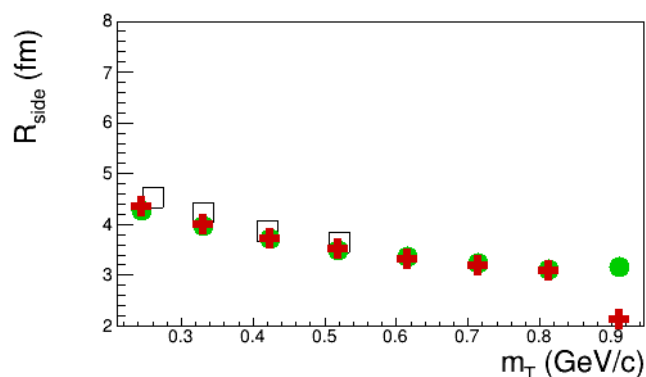
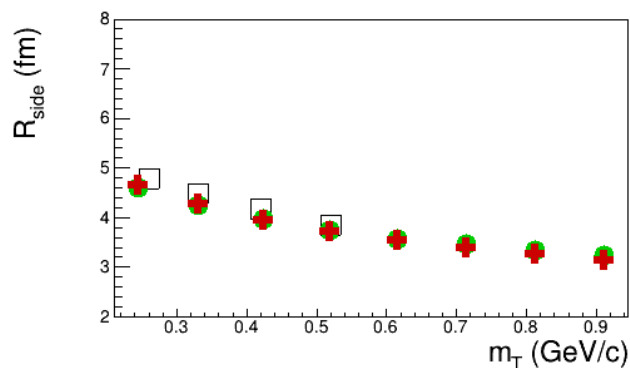
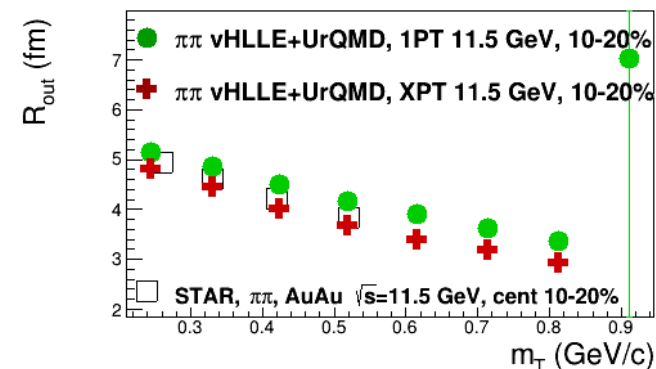
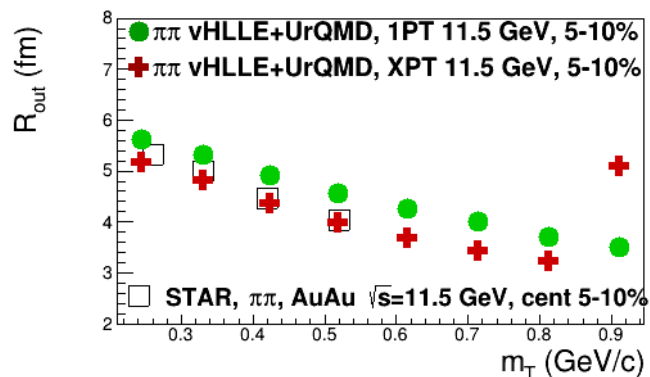
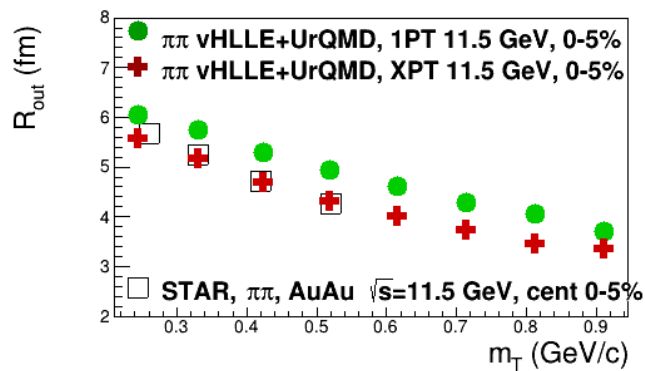
- Momentum range
  - $0.15 < p_T < 2.8$  GeV/c,
  - No cuts on momenta}
 negligible differences
- Randomization
  - pair swapping - default),
  - Full randomization
 negligible differences
- CF construction
  - Denominator from mixing of different events
  - denominator from same events w/o weights
 negligible differences
- Variation of fit range
  - $(-0.2, 0.2) - (-0.1, 0.1)$ $\sim 5\%$  differences
- Stable results

# 3D pion R(mT), sqrt(sNN) = 11.5 GeV

## 0-5%

## 5-10%

## 10-20%

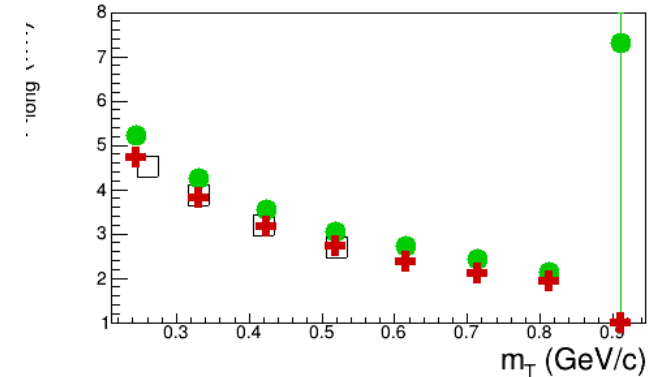
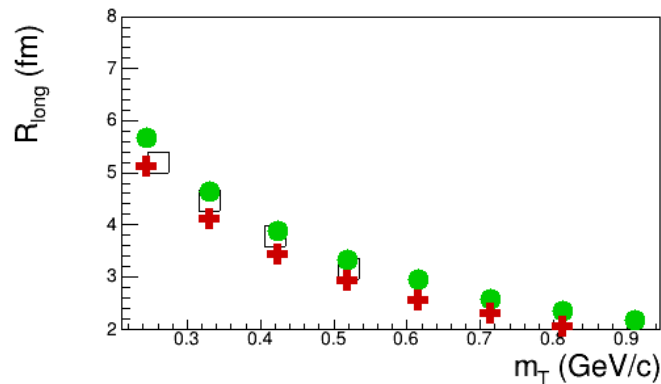
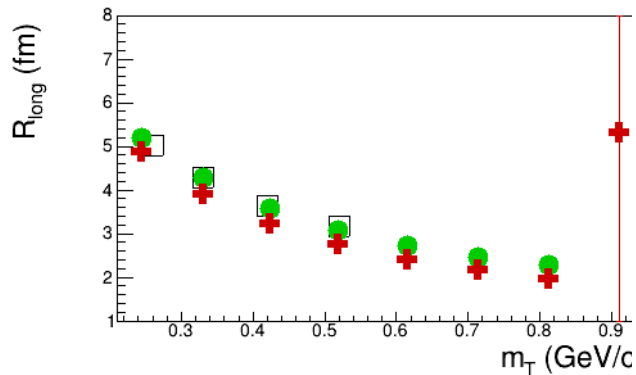
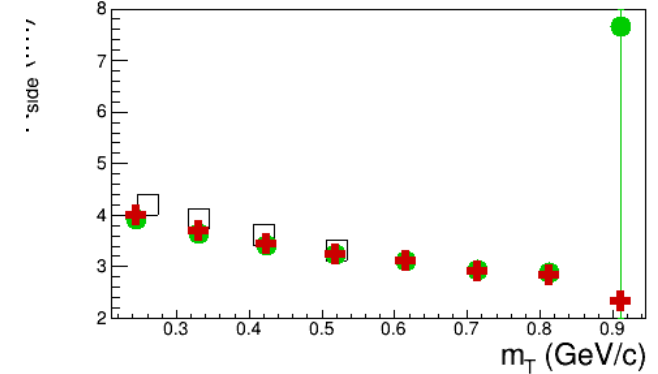
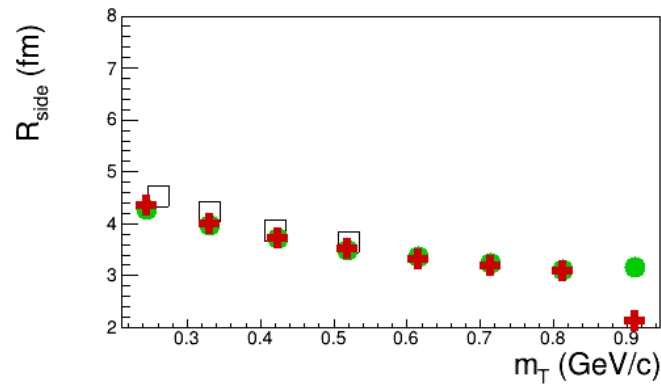
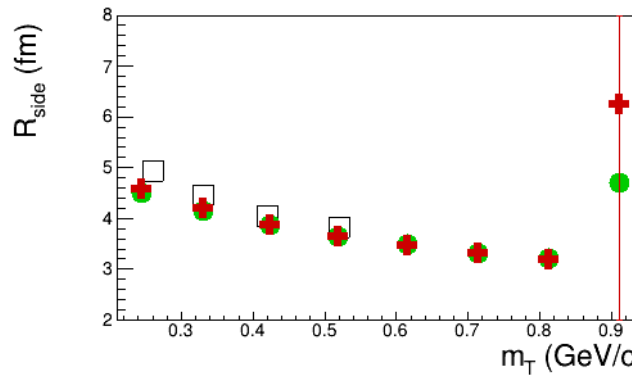
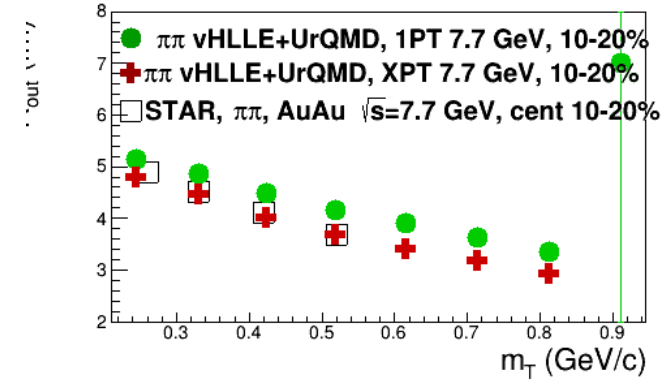
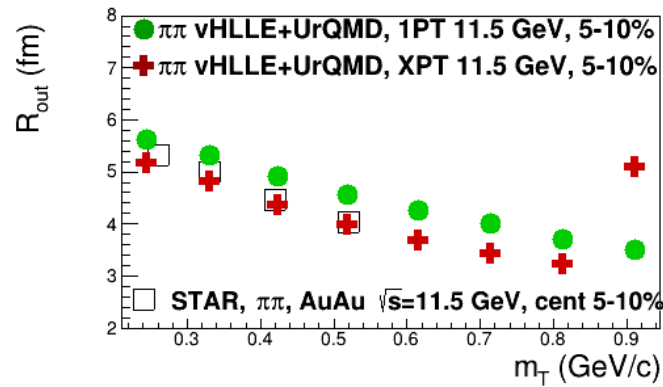
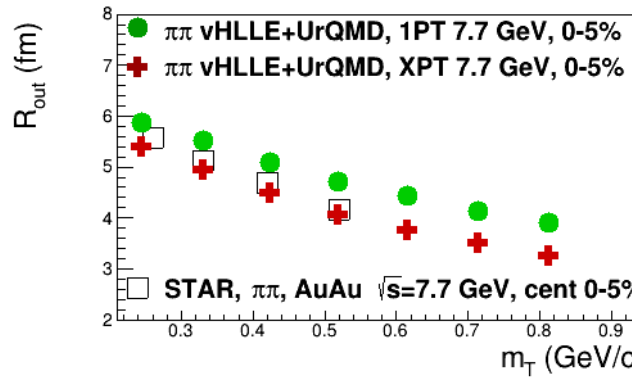


# 3D pion R(mT), sqrt(sNN) = 7.7 GeV

## 0-5%

## 5-10%

## 10-20%



---

# Backup

---

---

# Backup

---