

Event generators for elastic pp-scattering

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Introduction

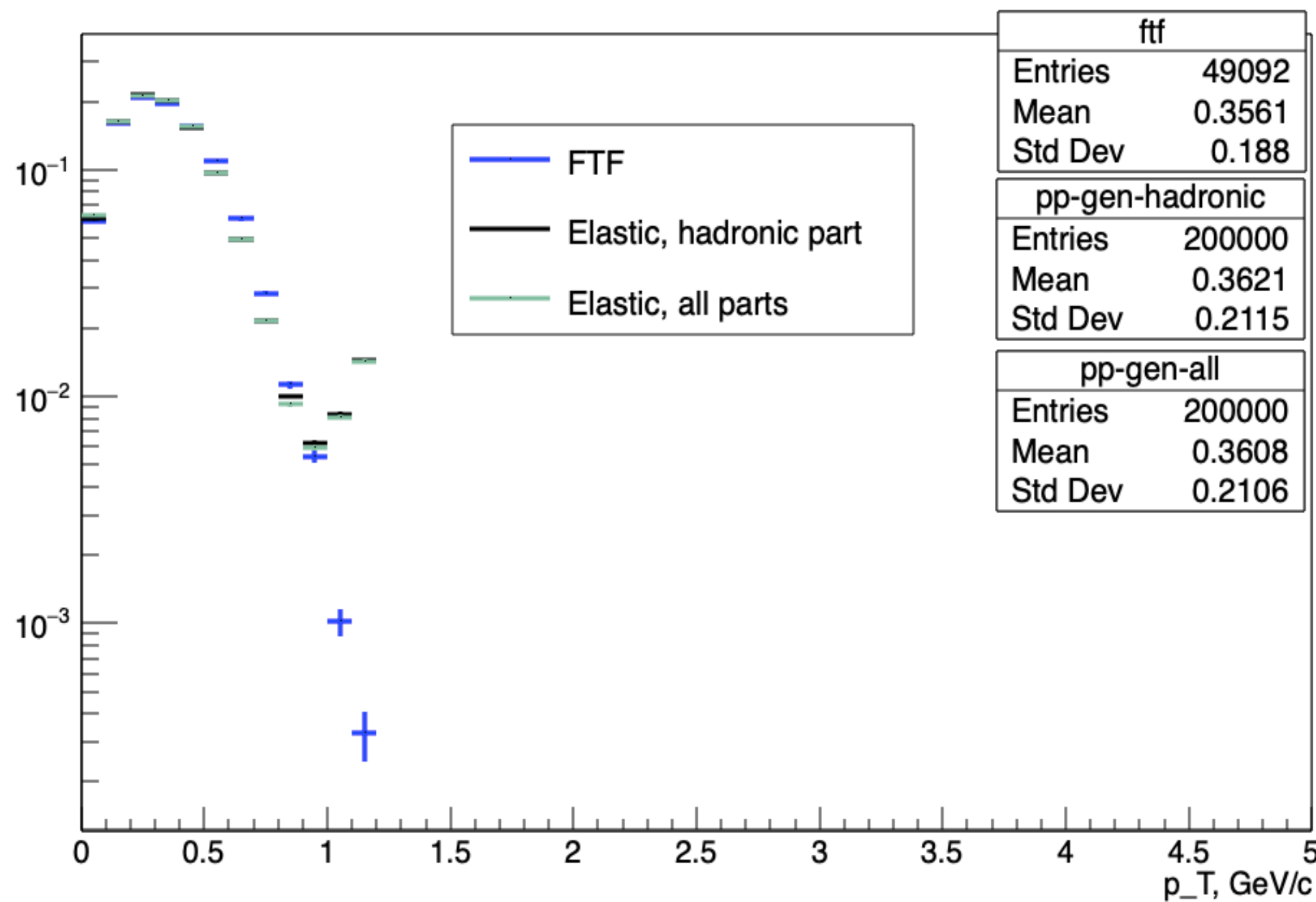
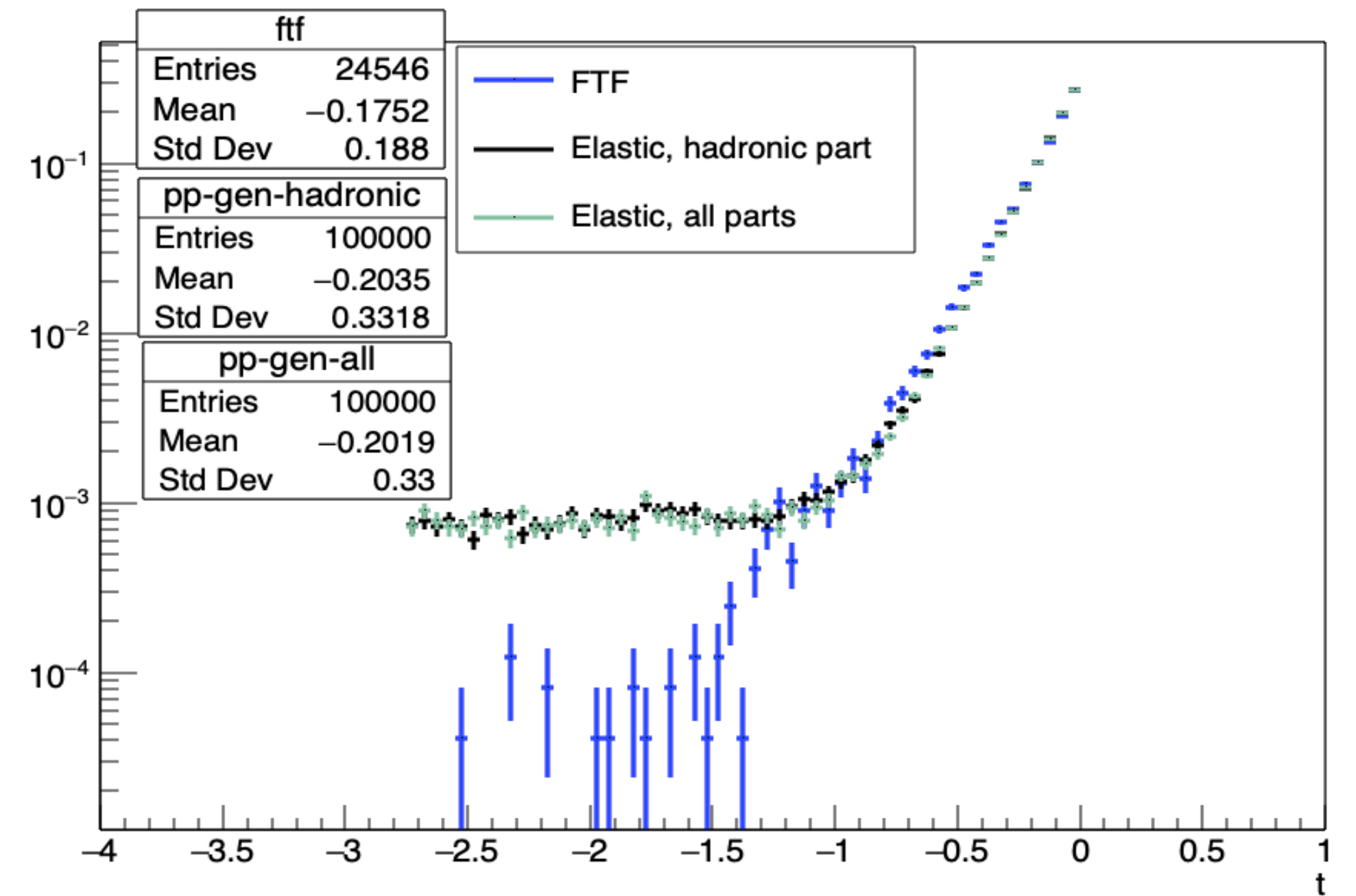
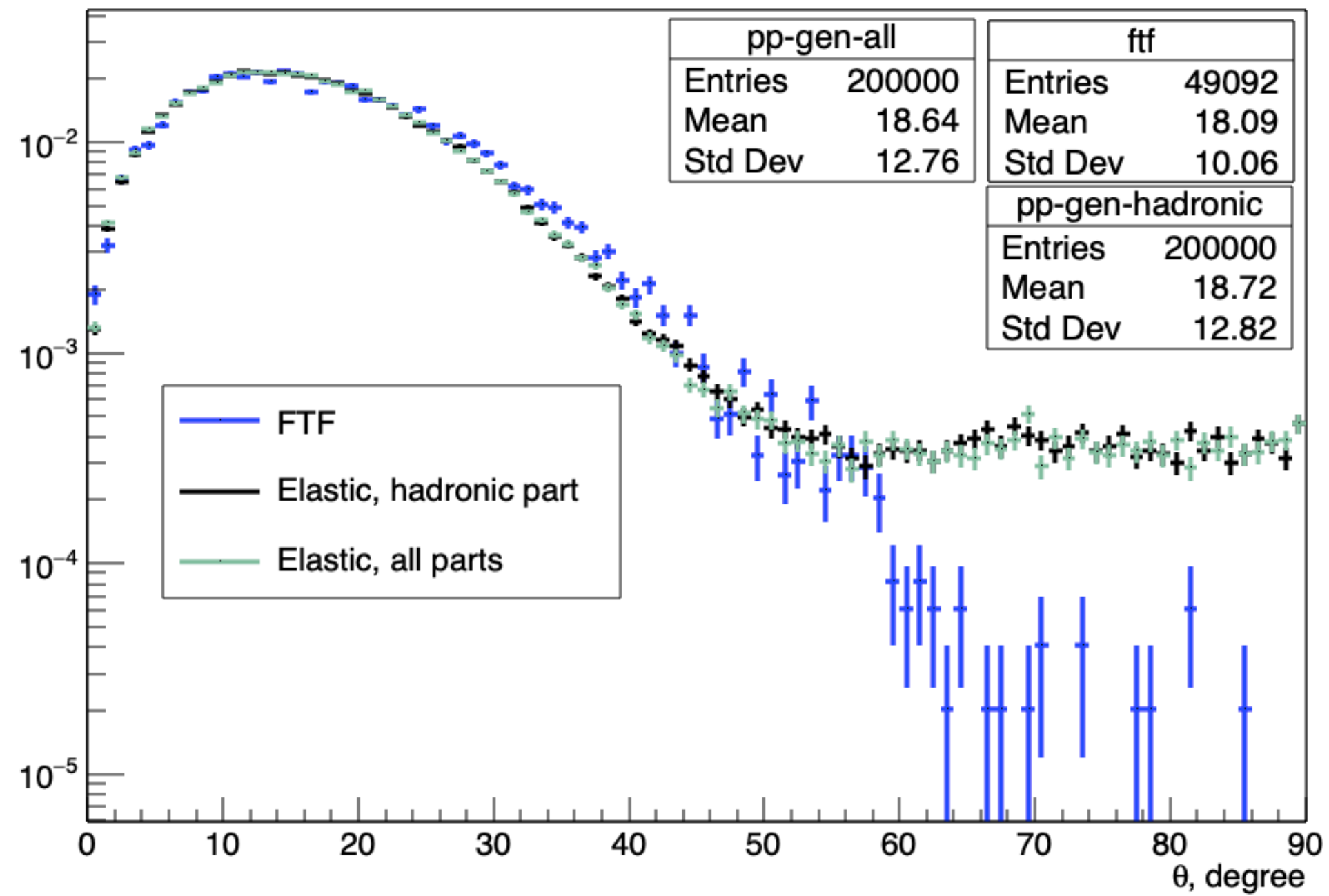
Regime1:
only hadronic Elastic scattering

Regime2:
Coulomb, interference and hadronic parts

$\sqrt{s} < 3.5 \text{ GeV}$ - low energy parametrization
 $3.5 < \sqrt{s} < 4.3$ - ongoing work
 $\sqrt{s} > 4.3 \text{ GeV}$ - high energy parametrization

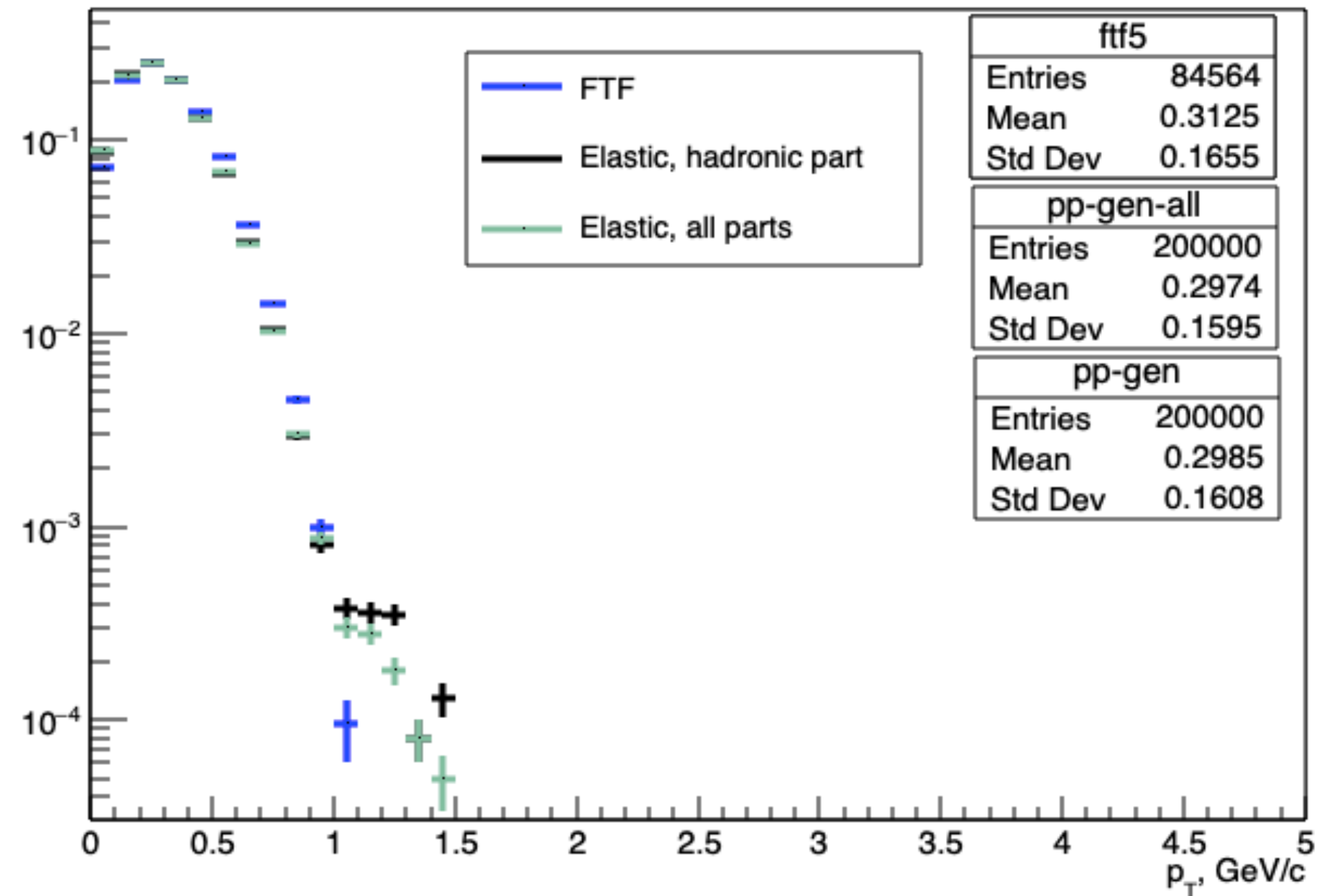
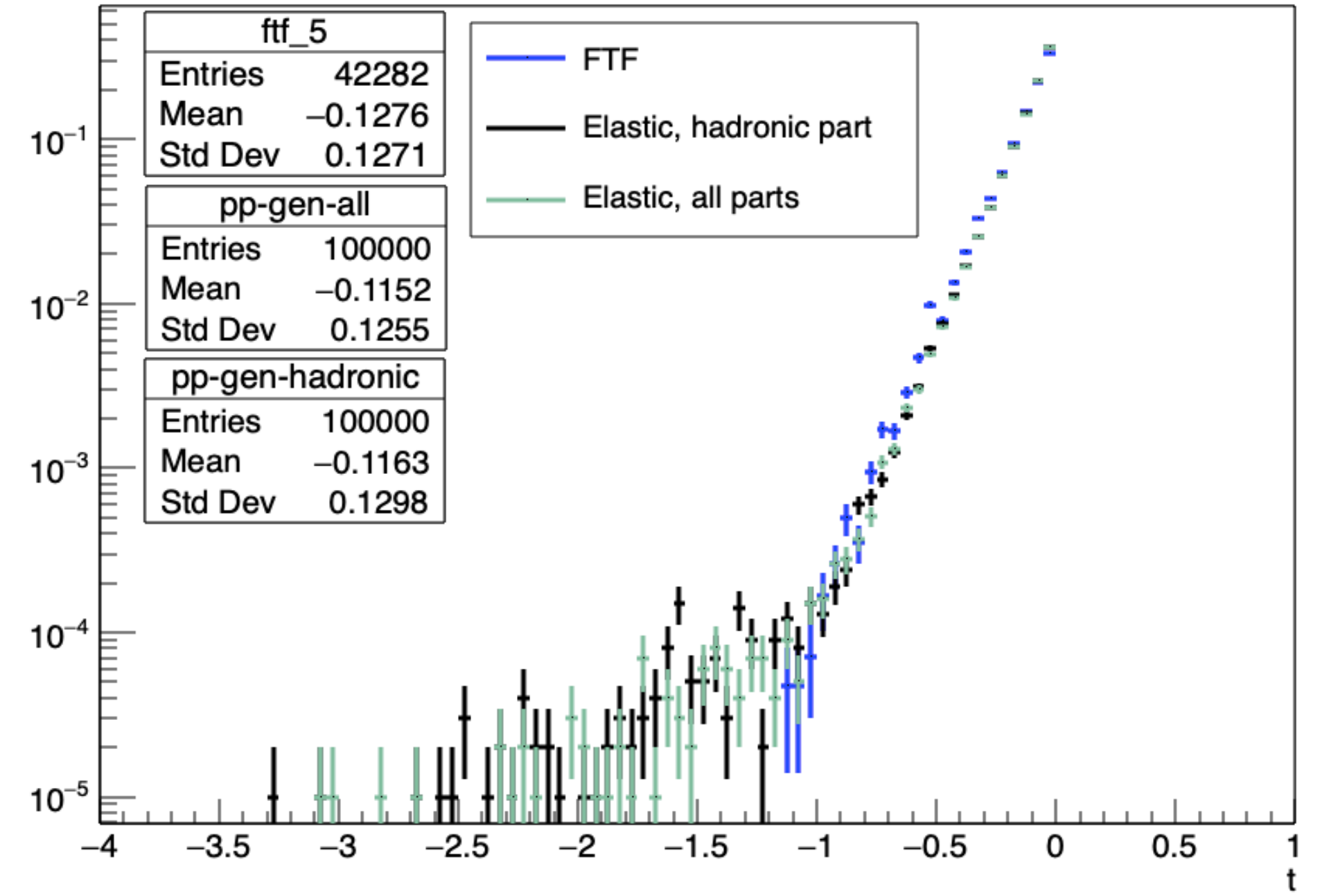
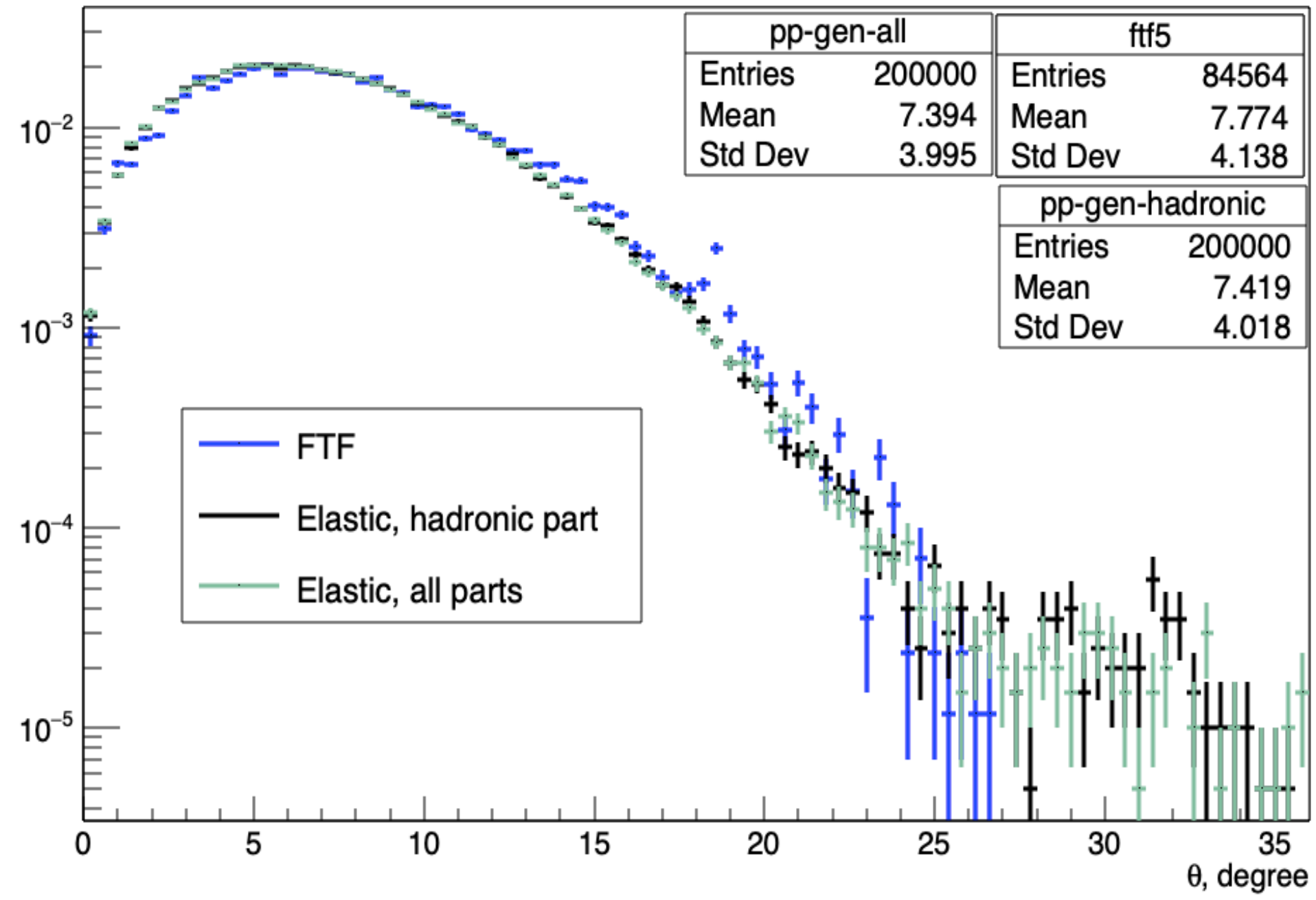
| | $\sqrt{s} = 3 \text{ GeV}$ | $\sqrt{s} = 5 \text{ GeV}$ | $\sqrt{s} = 10 \text{ GeV}$ | $\sqrt{s} = 27 \text{ GeV}$ |
|-----------------------------|--------------------------------------|----------------------------------|-------------------------------------|-------------------------------------|
| Elastic generator from Aida | Elastic: 16.28 mb Total: 42.92 mb | Elastic: 8.98 mb Total: 41mb | Elastic: 6.87 mb Total: 41mb | Elastic: 6.23 mb Total: 41mb |
| FTF | Elastic: 14.9 mb Total: 42.29 mb | Elastic: 9.58 mb Total: 39 mb | Elastic: 7.33 mb Total: 38.26 mb | Elastic: 6.96 mb Total: 39.83 mb |
| Pythia8 | | | Elastic: 7.11 mb Total: 38.45 mb | Elastic: 6.97 mb Total: 39.8 mb |

$$\sqrt{s} = 3 \text{ GeV}$$

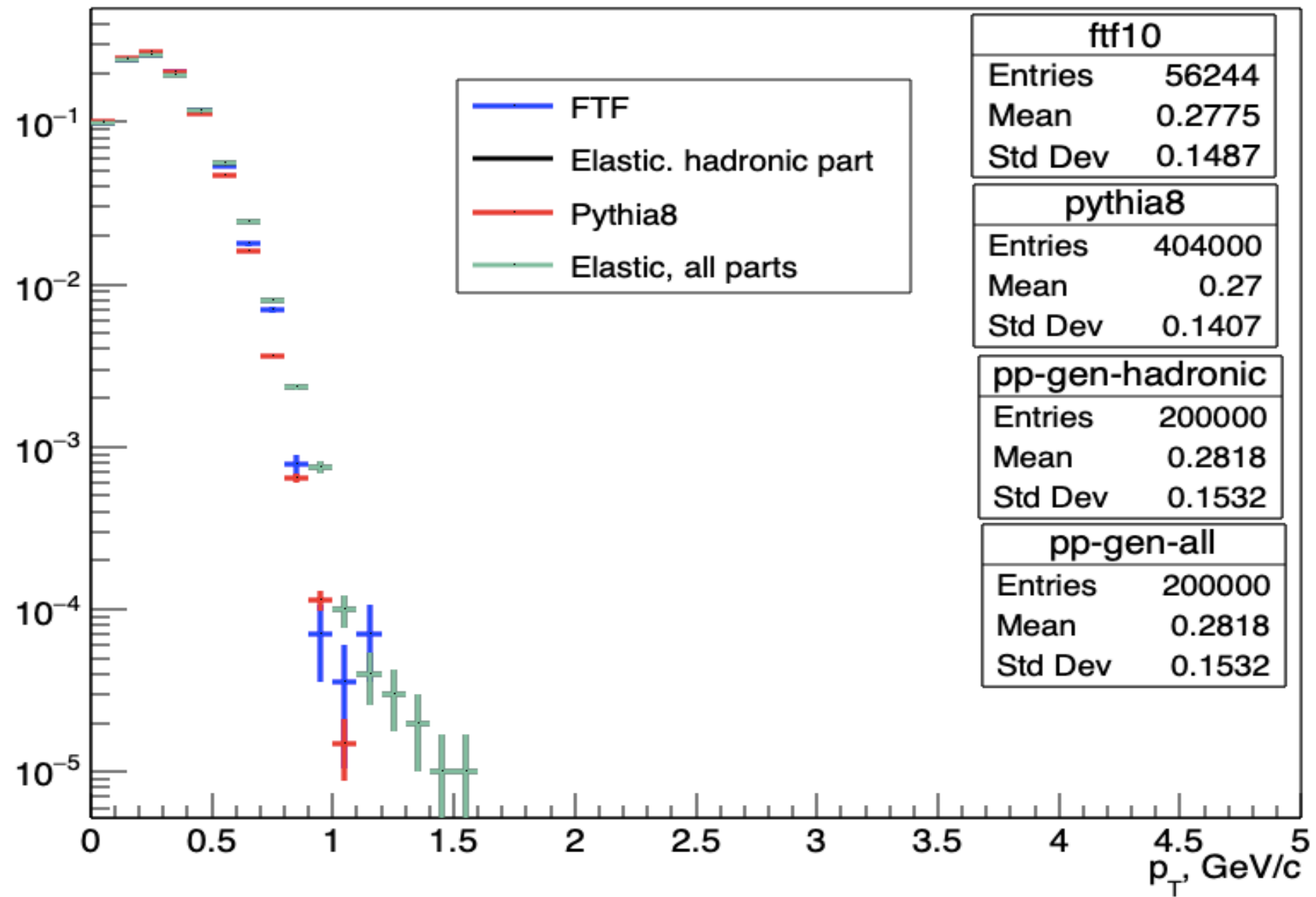
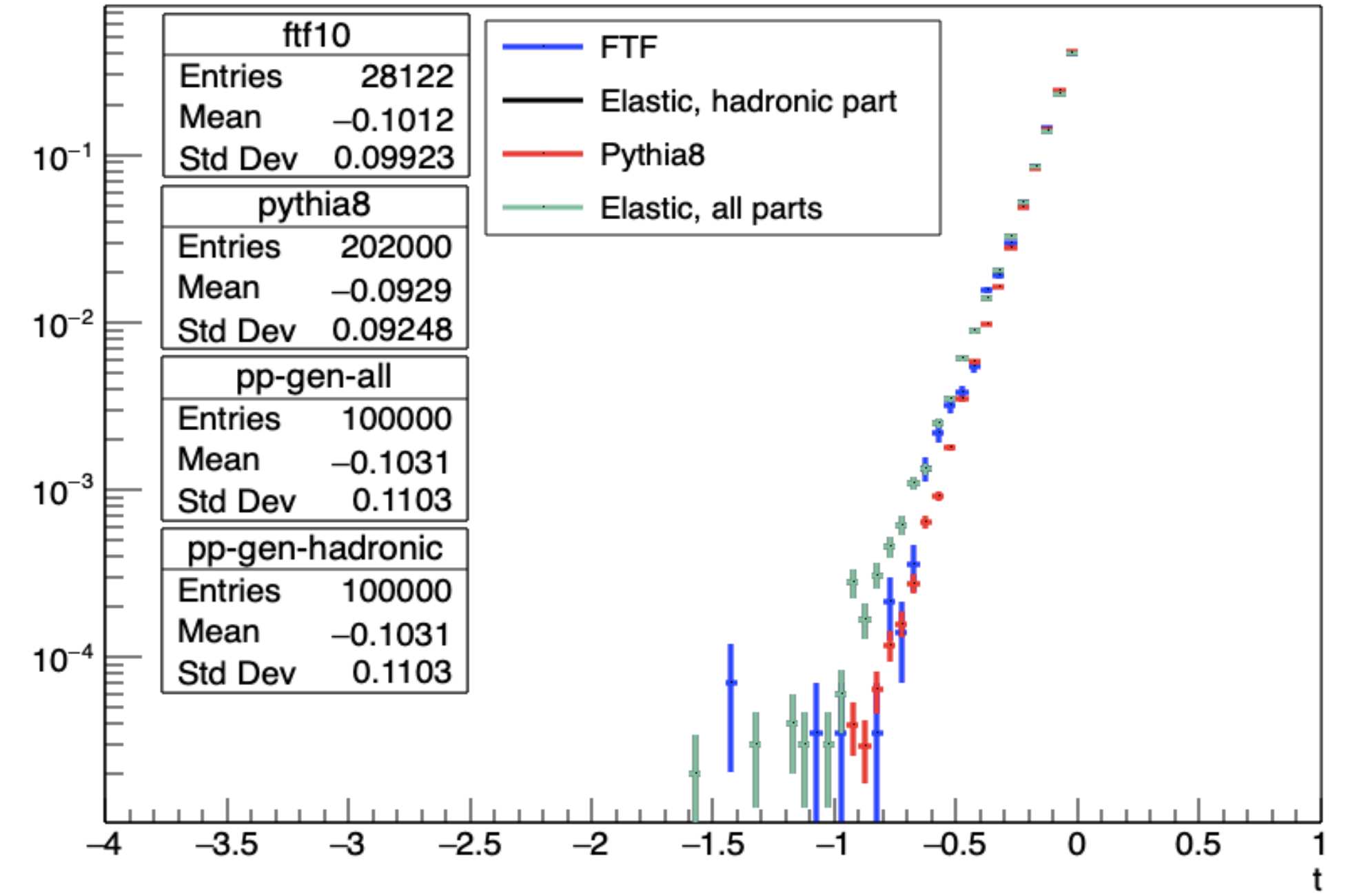
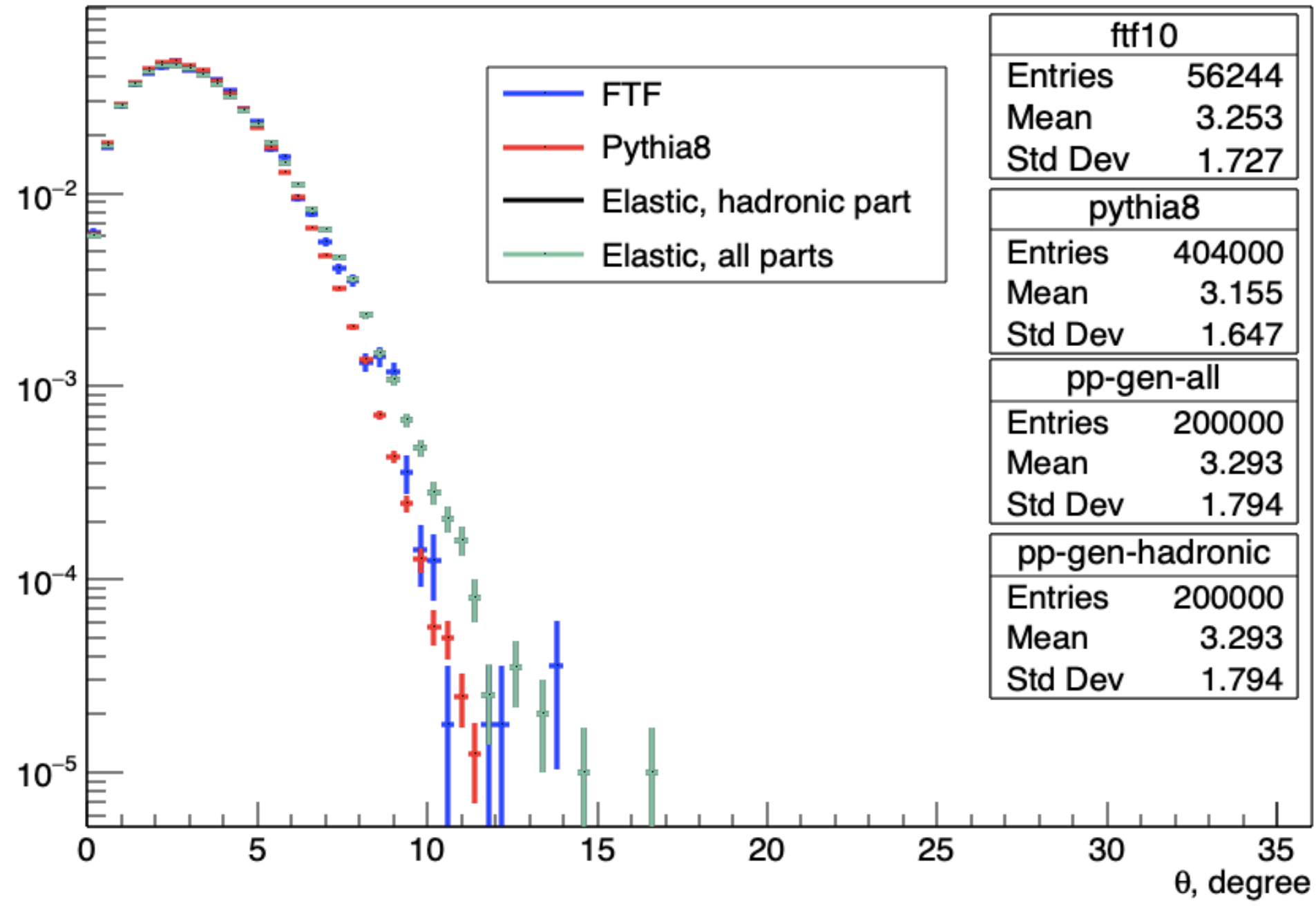


Distributions are compared on the generator level.

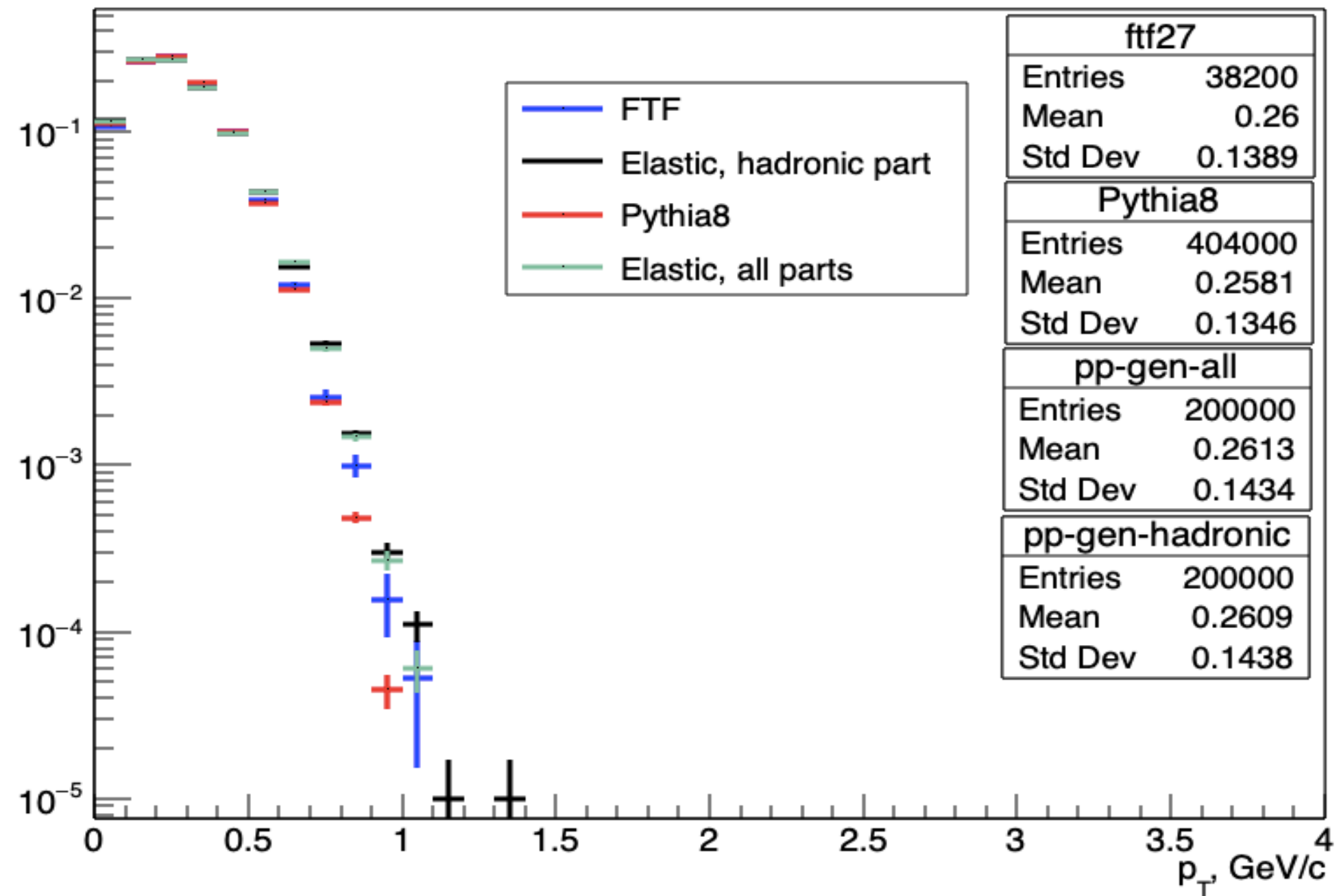
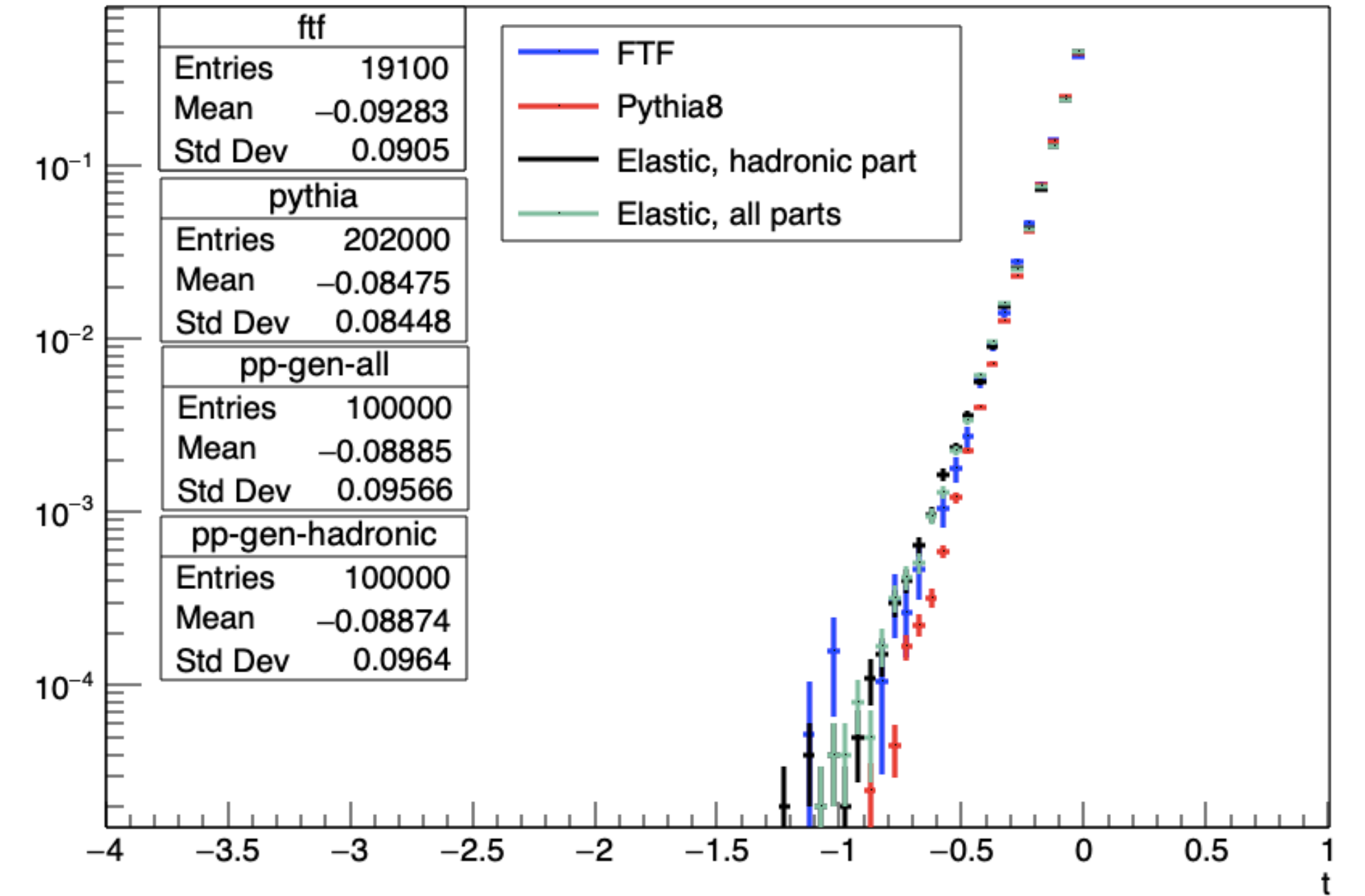
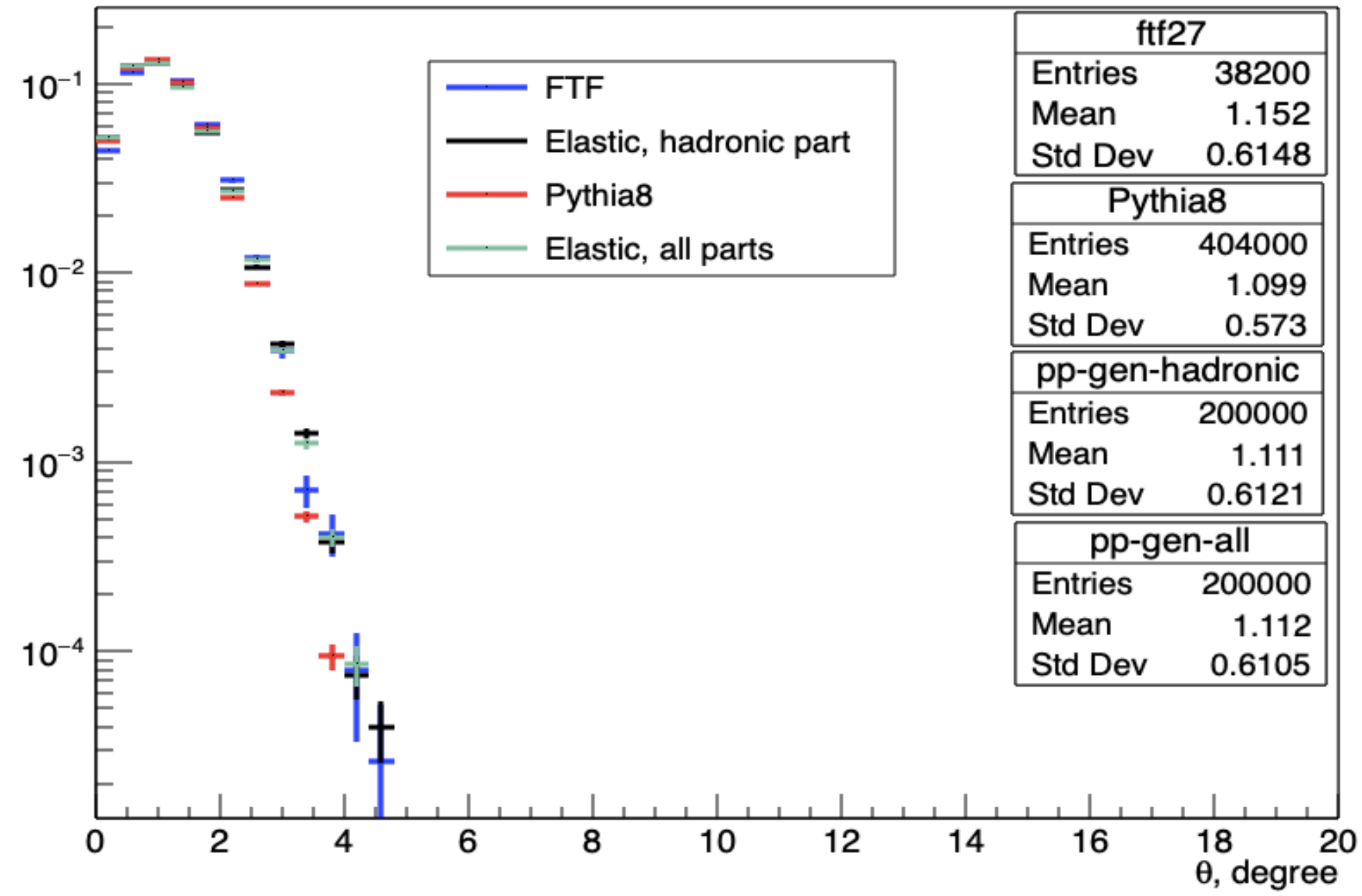
$$\sqrt{s} = 5 \text{ GeV}$$



$$\sqrt{s} = 10 \text{ GeV}$$



$$\sqrt{s} = 27 \text{ GeV}$$



Conclusions

- Coulomb and interference parts give a contribution at small t . It will be visible if one will put $\theta_{min} < 0.1$. Tails of θ and t -distributions are expected for elastic generator (it is more correct comparing to Pythia8 and FTF).
- For MC simulation one can use Pythia8 / FTF generators. There are no difference in the shape of distributions at $\sqrt{s} = 10$ GeV and $\sqrt{s} = 27$ GeV.