

Kaon production from NA61 - update

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December 4, 2020

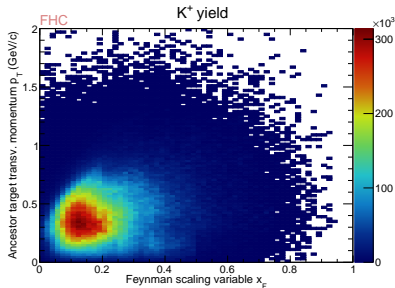
University of Sussex
NOvA & DUNE PPFX meeting



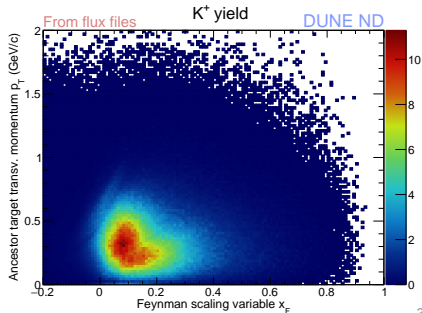
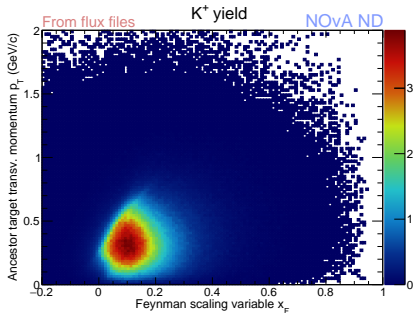
- ▶ Presenting x_F VS p_T yields of kaons and pions from p+C interaction from
 - ▶ NOvA CAF files
 - ▶ NOvA flux files
 - ▶ DUNE flux files
- ▶ Overlapping these yields with current NA61 coverages
- ▶ Data/MC comparison in $p - \theta$

Updating PPFX - K^+ yields

From CAFAna

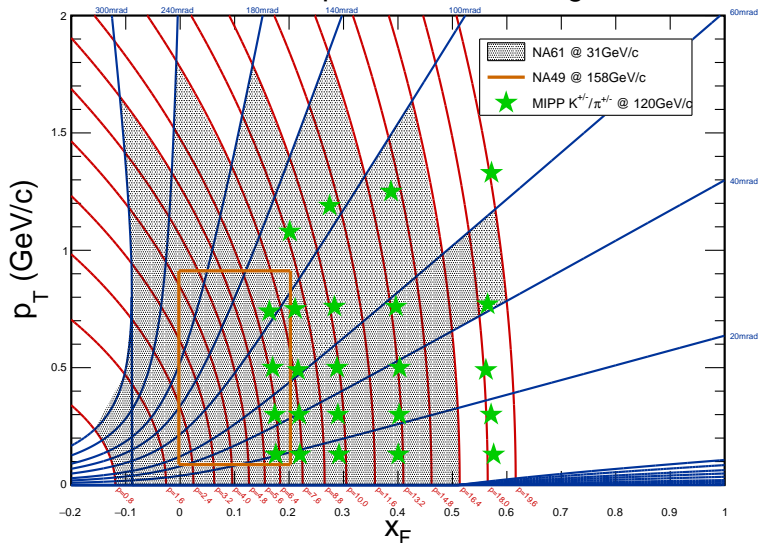


From flux files



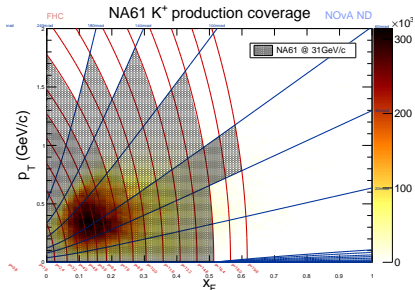
Updating PPFX - NA61 Coverage comparison

NA61 K^+ production coverage

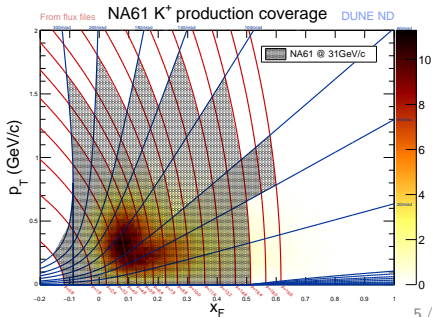
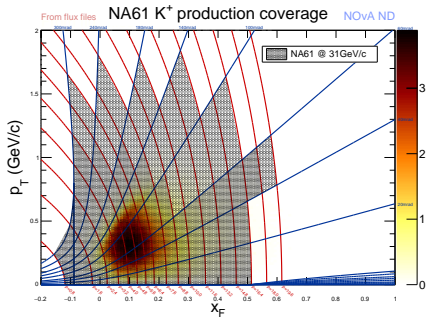


Updating PPFX - K^+ yields with NA61 Coverage

From CAFAna

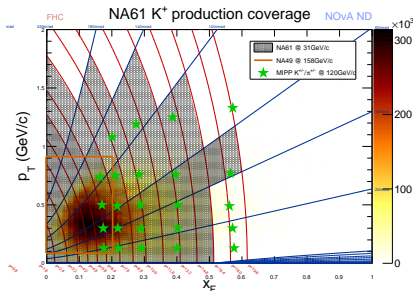


From flux files

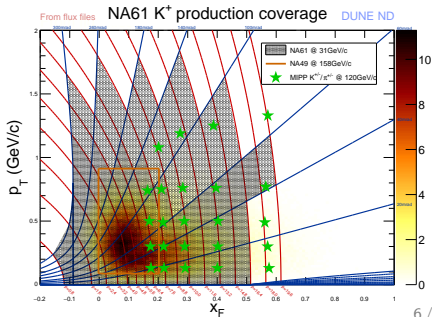
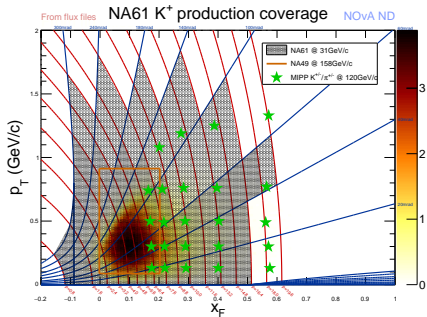


Updating PPFX - K^+ yields with NA61 Coverage

From CAFAna

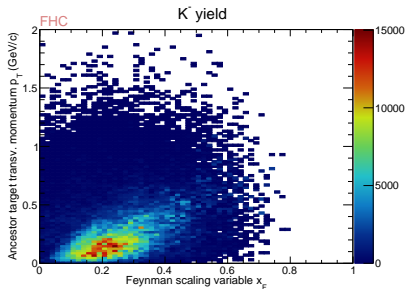


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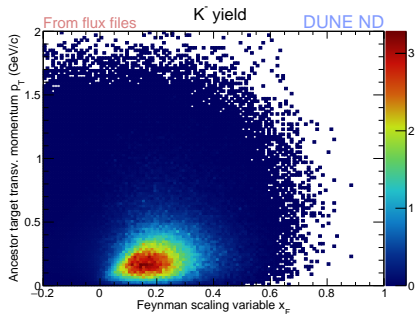
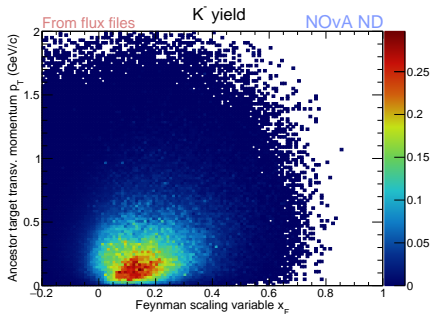


Updating PPFX - K^- yields

From CAFAna

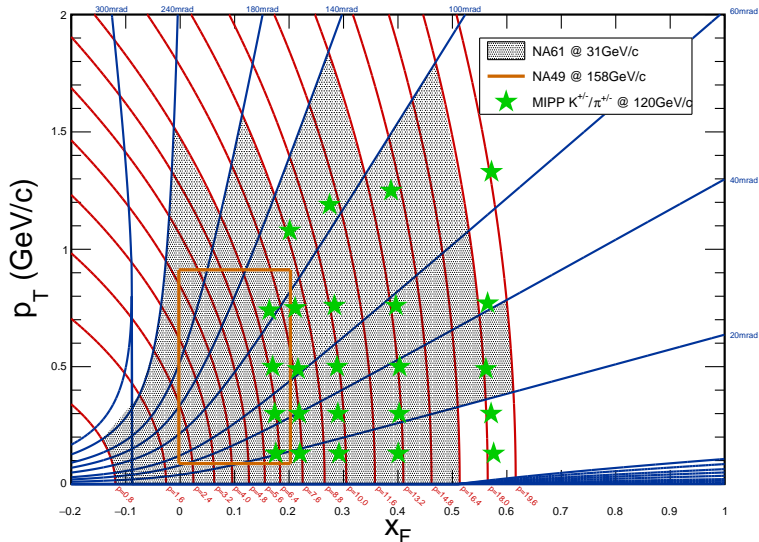


From flux files



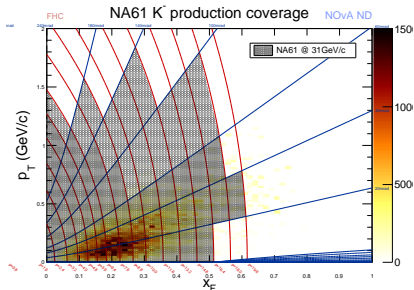
Updating PPFX - NA61 Coverage comparison

NA61 K^- production coverage

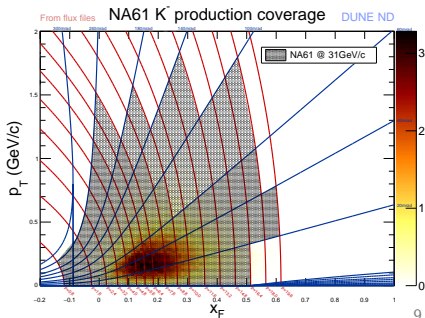
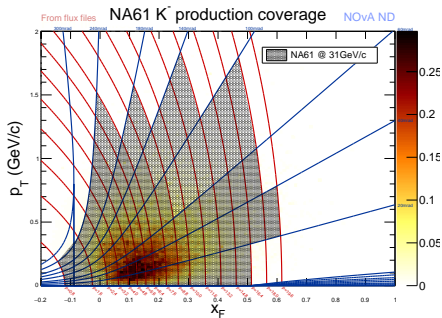


Updating PPFX - K^- yields with NA61 Coverage

From CAFAna

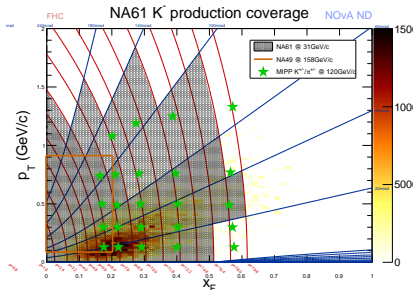


From flux files

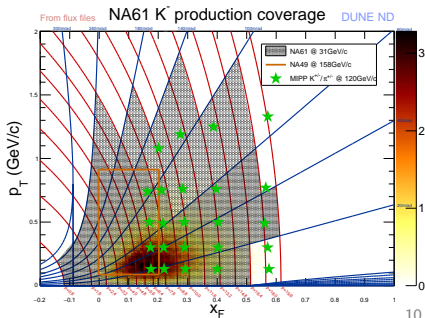
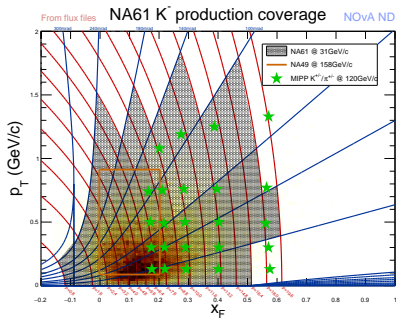


Updating PPFX - K^- yields with NA61 Coverage

From CAFAna



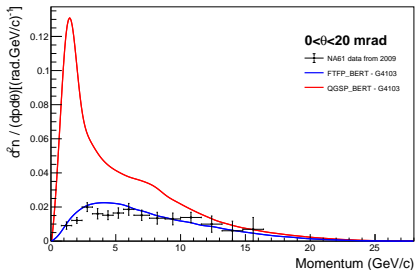
From flux files



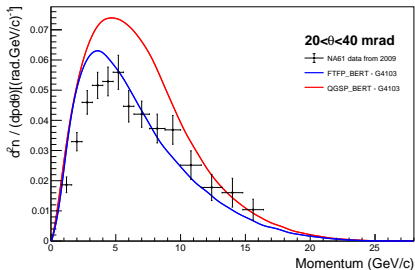
- ▶ Comparing data and MC from g4hp for $p + C \rightarrow K^+ + X$
- ▶ FTFP_BERT and QGSP_BERT with DUNE Geant4 version v04_10_3_p03b
- ▶ @ NA61 incident proton energy in $p - \theta$ phase space
- ▶ Notice strange discrepancy between my QGSP_BERT results and the QGSP_BERT shown in NA61 paper
 - ▶ Is it due to different Geant4 versions?

Data MC comparison

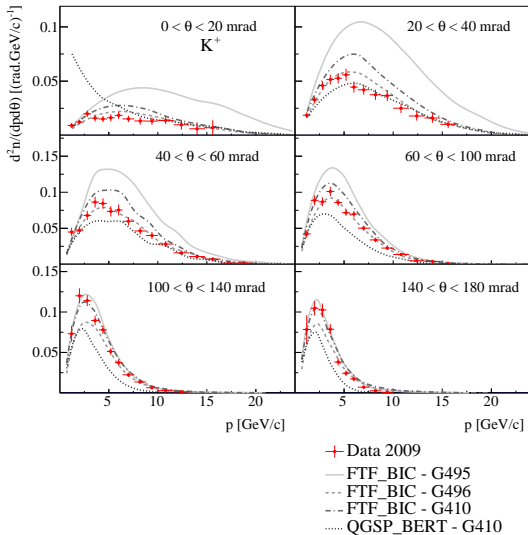
$p+C \rightarrow K^+X$ @ 31GeV/c



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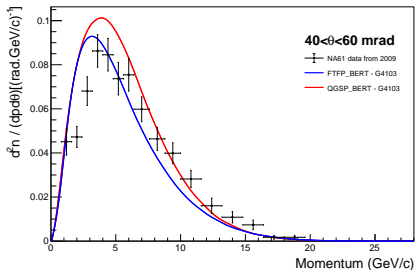


Results from NA61 paper

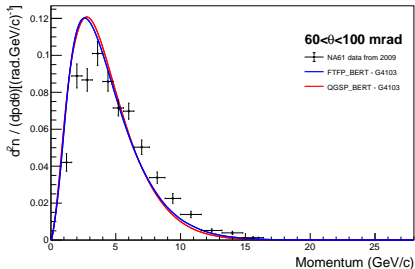


Data MC comparison

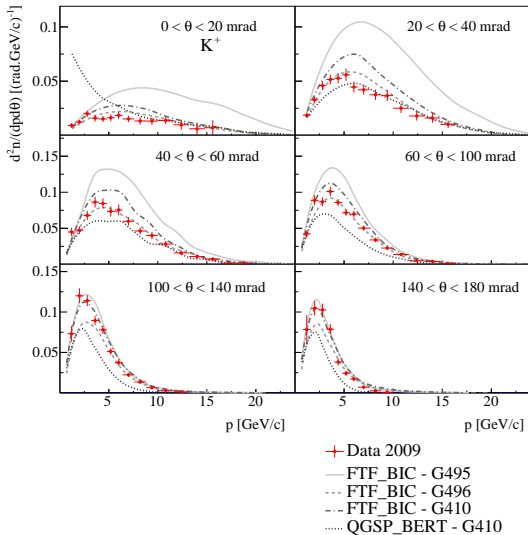
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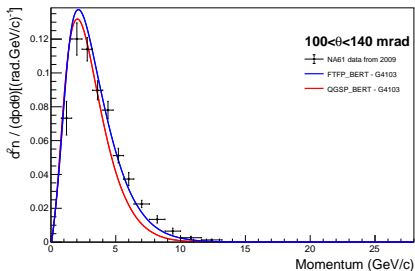


Results from NA61 paper

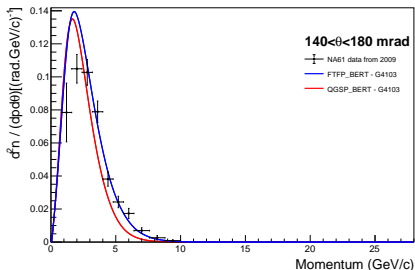


Data MC comparison

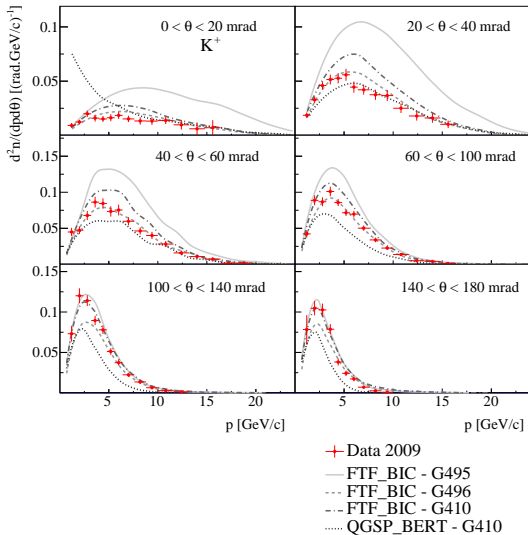
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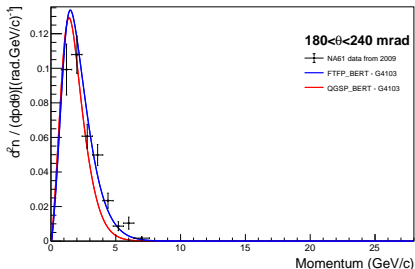


Results from NA61 paper

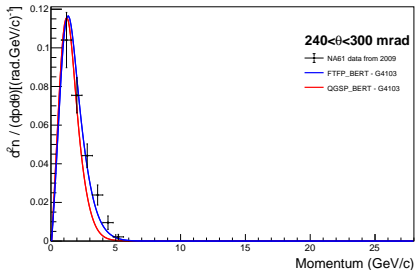


Data MC comparison

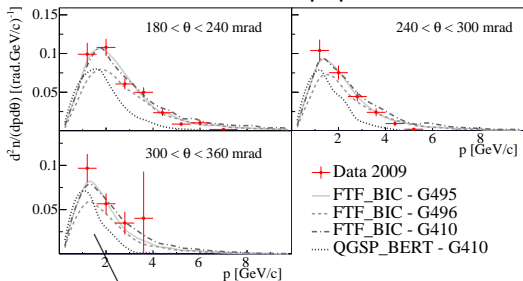
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p+C → K⁺+X @ 31GeV/c



Results from NA61 paper



Where are these data from?
They are not in the table...

- ▶ Add negative Kaons to data-MC comparison
- ▶ Do the comparison in invariant cross sections (in $p_T - x_F$ phase space) using the centres of bins
- ▶ Extrapolate the invariant cross section to NA49 energies and compare the two data to check the extrapolation
- ▶ Go over the other ways of NA61 data extrapolation

Backup