Status of the TOF 30 AGeV analysis.

Data set:
390k STD+ (APR02) (7% 30 AGeV)

Event selection:
- vertex_fit.iflag = 0
- \( |\text{vertex}_\text{fit.z} - Z_{\text{target}}| < 1 cm \)
- \( (N_{\text{TOFhits}})_\pi > 3 \)

Track quality cuts:
- track.px > 0.
- global tracks MTPC matched with VT1/VT2
- track.iflag = 0
- last point (tuned a bit for 30 AGeV)

TOF cuts:
- multyhits
- edge cut (1mm)
- QDC cut (0.8 < QDC < 1.6)(1.75 for low momentum)

TOFL eff. = 70%
TOF performance (30 AGeV)

- Calibration done ($\sigma_{TOF} < 80$ ps)
- Corrected TOF avail. (by plugin)
- Constants should be OK for the 20 AGeV data
• Track & TOF quality cuts
• $(P - P_t)$ binning ($\Delta P=1$, $\Delta P_t=0.2$ GeV/c)
• $(dE/dx-m^2)$ - parameterisation
• Corrections eval.
TOF acceptance (30 GeV)

- $P_{t}$ for different particles and $Y$ values.
- $P=2$ and $P=7$ highlighted for $K$ particles.

Graphs showing $P_{t}$ against $Y$ for $\pi$, $K$, $p$, and $d$ particles.
TOF (30 AGeV). Kaon+ (2.0 < Y < 2.2)

\[ \frac{1}{m_t} \frac{d^2N}{dm_t dy} \]

\[ \frac{dn}{dy} = 20.9 \pm 0.3 \pm 0.7 \]

\[ T = 233 \pm 3 \pm 4 \text{ MeV} \]
TOF-dE/dx comparison (30 GeV)

- TOF (Y=2.2) (*0.8)
- dE/dx (Y=2.9)

K+ $dN/dp_t$

- TOF (Y=1.5-2.2)
- dE/dx (Y=2.7)
- dE/dx (Y=2.9)
TOF-dE/dx comparison (30 GeV)

- TOF (Y=2.3)
- dE/dx (Y=2.3)

- TOF (Y=2.5)
- dE/dx (Y=2.5)
TOF-dE/dx comparison (30 GeV)

\[ dN/dp_t \]

- TOF (Y=2.7)
- dE/dx (Y=2.7)

\[ dN/dp_t \]

- TOF (Y=2.9) (*0.58)
- dE/dx (Y=3.5)
$K^+ m_t$-spectra (30-158 AGeV) at midrap.

- $30$ AGeV (234)
- $40$ AGeV (233)
- $80$ AGeV (232)
- $158$ AGeV (236)
$K^+ p_T$-spectra (30-158 AGeV) at midrap.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{$dN/dp_T$ for different energy ranges and their average $p_T$ values.}
\end{figure}
Corr. factor (TOF cuts, midrapid.)

<table>
<thead>
<tr>
<th>Correction</th>
<th>$\Delta$ dn/dy(%)</th>
<th>$\Delta$T(MeV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>1%</td>
<td>1.5</td>
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<tr>
<td>TOF quality cuts</td>
<td>1.5%</td>
<td>2.3 $\div$ 3</td>
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<tr>
<td>Decay (GEANT)</td>
<td>0</td>
<td>0</td>
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<tr>
<td>$N_{hit} &gt; 3$ cut (*)</td>
<td>1$\div$2 %</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>$\approx$ 0.7</td>
<td>5</td>
</tr>
</tbody>
</table>

(*) Variation of $p$, $K+$ yield at $N_{hit} >4,5,6,7...$
Summary:

- 30 AGeV K+ analysed
- K+ yield is the same as at 40 AGeV
- Slope parameter (K+)-spectra seems to be constant at 30-158 GeV

To Do:

- p spectra (feeddown)
- d spectra
- B2-business...
- Preparation for the 20 AGeV analysis (calibration, acceptance, etc.)