

Baryonspektroskopie – $pp \rightarrow p\pi^0p$ Partialwellenanalyse Statusreport Woche 9

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Gruppenmeeting
10. Dezember 2013



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

Themen für heute

Parametrisierung im GJ-Frame

Akzeptanzkorrektur im GJ-Frame für $p\pi^0$ und $p\eta$



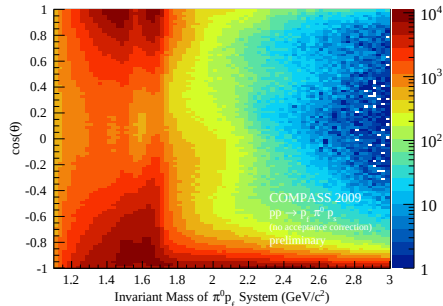
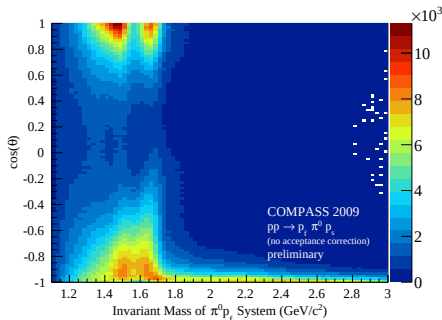
Gottfried-Jackson Frame

- ▶ Rest frame of $p_f\pi^0$;
- ▶ y-axis: orthogonal to production plane ($\text{beam} \times p_f\pi^0$)
- ▶ z-axis: along beam direction
- ▶ x-axis: follows from right-handed coordinate system



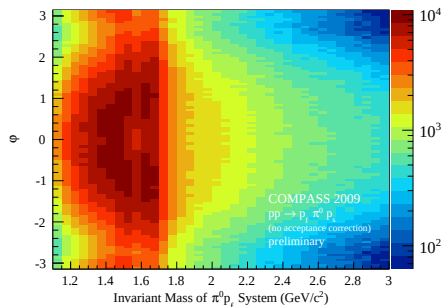
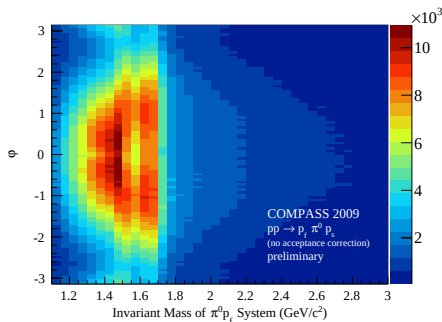
$pp \rightarrow p_{\text{rec}}\pi^0 p_{\text{f}} - \text{Gottfried-Jackson Angles}$

Polar angle $\cos(\theta)$ vs. invariant mass



$pp \rightarrow p_{\text{rec}}\pi^0 p_{\text{f}} - \text{Gottfried-Jackson Angles}$

Azimuthal angle φ vs. invariant mass



Parametrisierung

- ▶ Wir betrachten nur $\mathbf{X} \longrightarrow p\pi^0$
- ▶ Zerfall im Schwerpunktsystem

$$\frac{d\Gamma}{d\Omega} = \frac{1}{32\pi^2} \frac{|p|}{M^2} |\mathcal{M}|^2$$

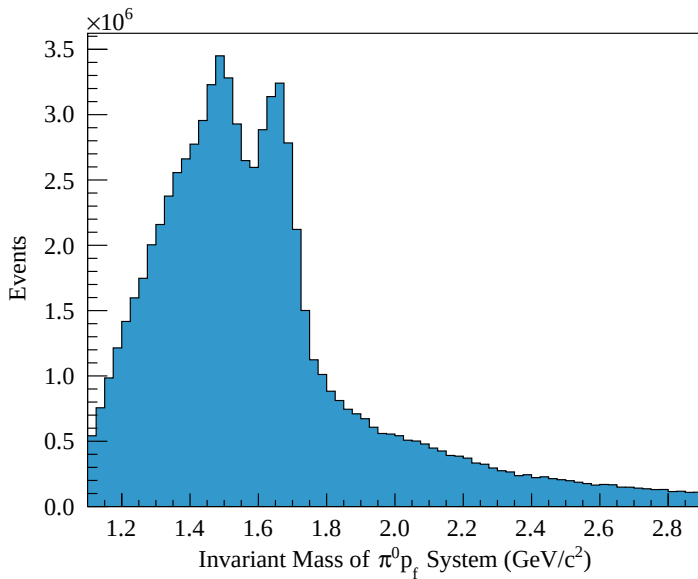
- ▶ Partialwellenzerlegung

$$|\mathcal{M}|^2 = \sum_{\lambda} \left| \sum_{J, M_J} \sqrt{\frac{2J+1}{4\pi}} \mathbf{A}_{JM_J\lambda} \mathbf{D}_{M_J\lambda}^J(\Omega) \right|^2$$

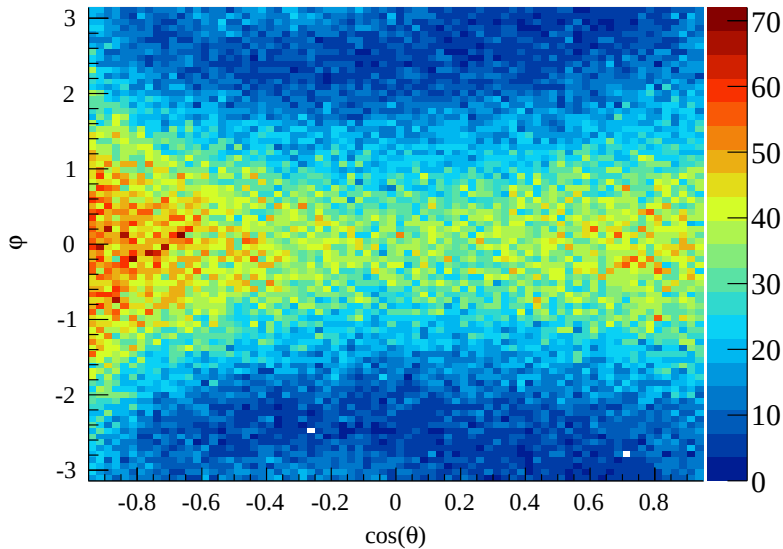
mit

$$\mathbf{D}_{JM_J\lambda}^J(\Omega) = e^{iM_J\varphi} \mathbf{d}_{JM_J\lambda}^J(\theta)$$

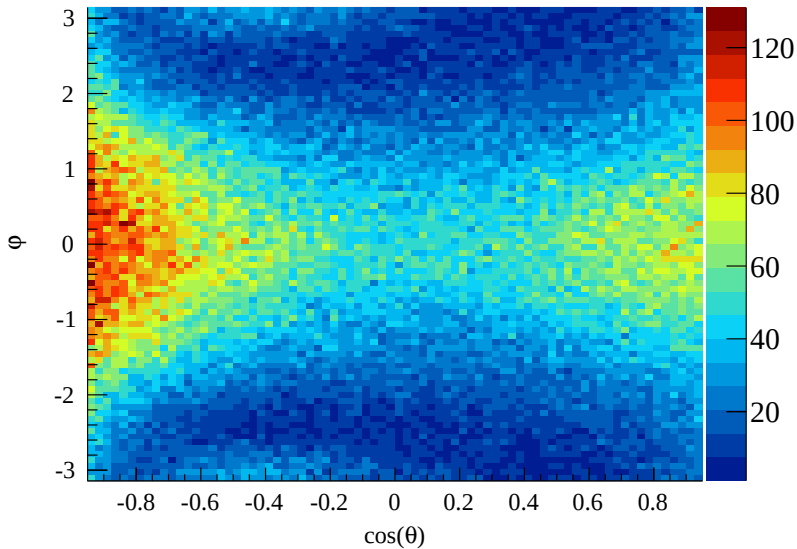
- ▶ Abhängigkeit von φ und θ (keine Mittelung über Spins der einlaufenden Teilchen)



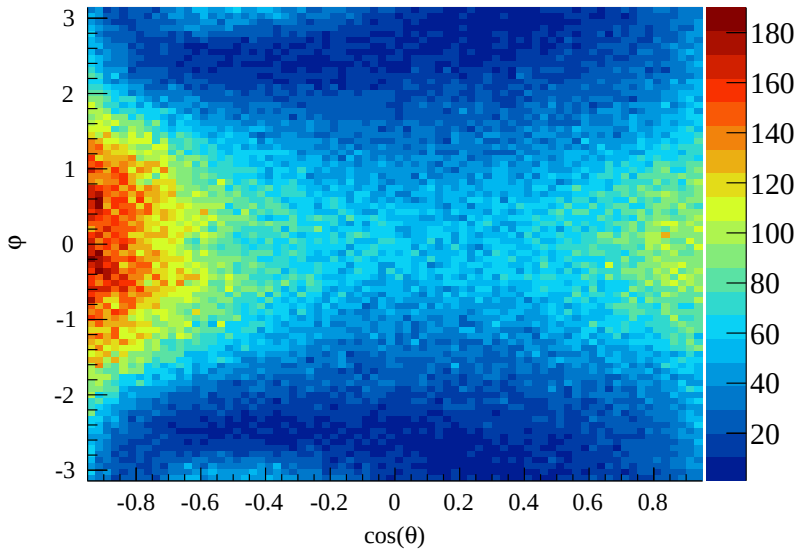
1100 MeV



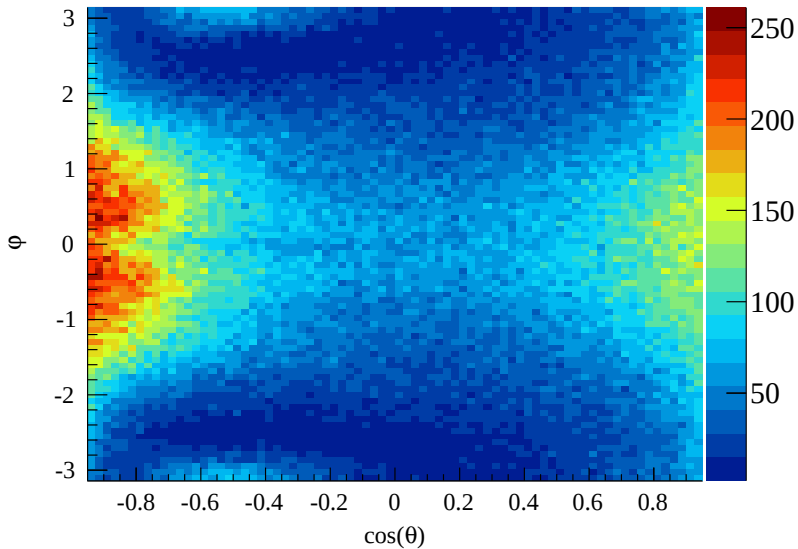
1150 MeV



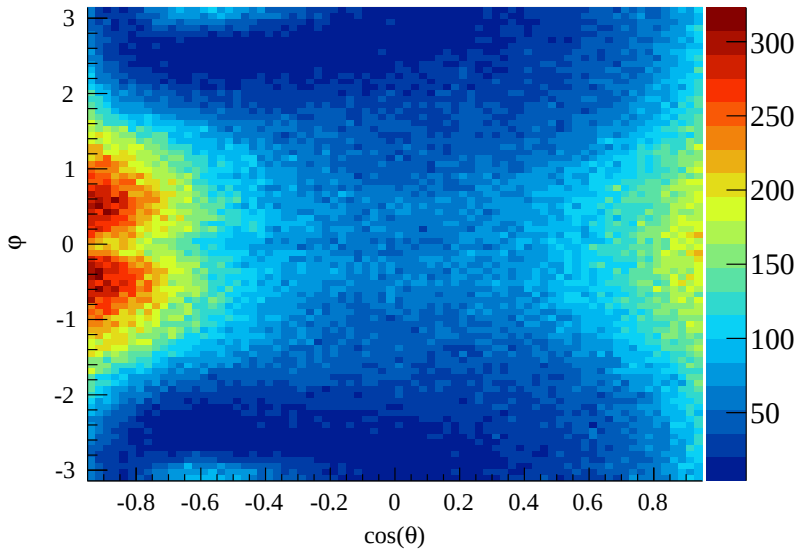
1200 MeV



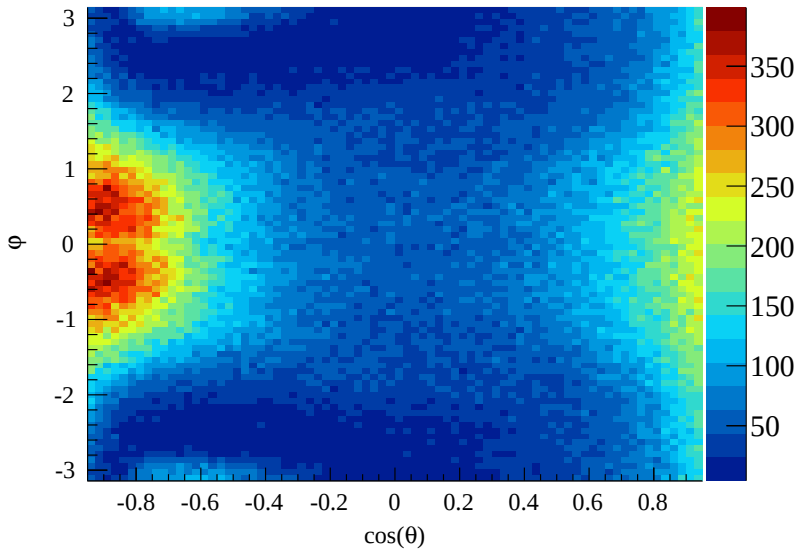
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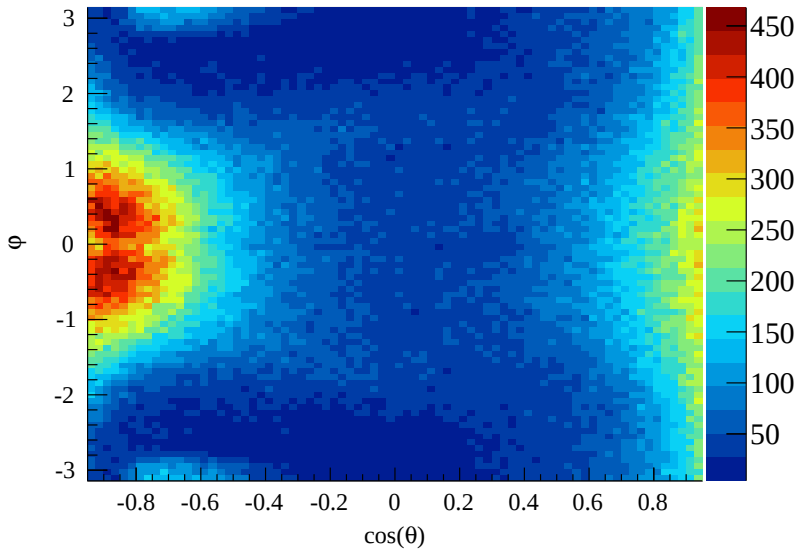
1300 MeV



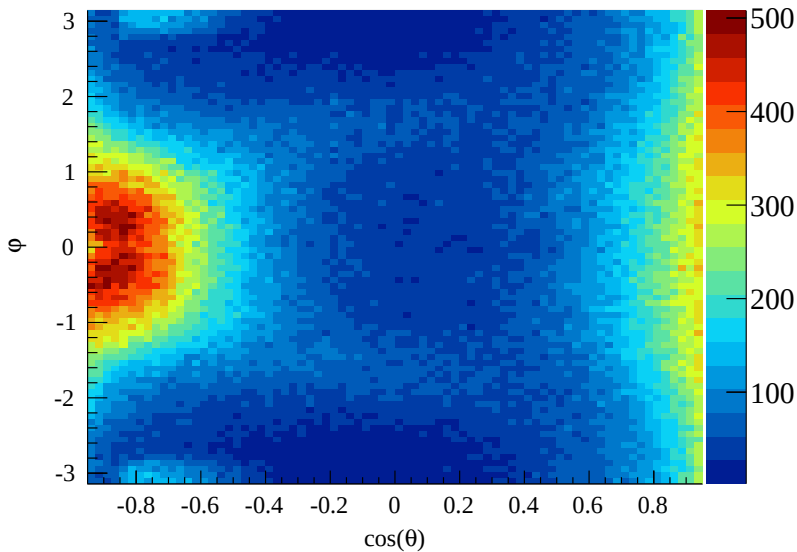
1350 MeV



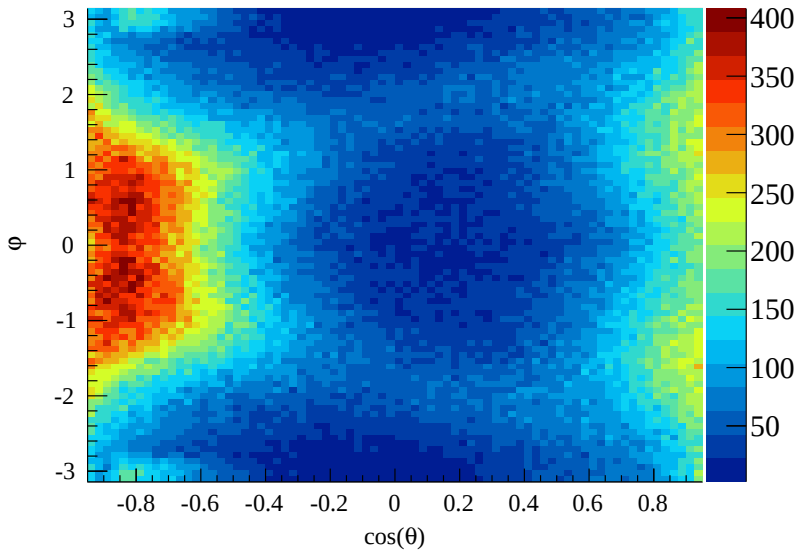
1400 MeV



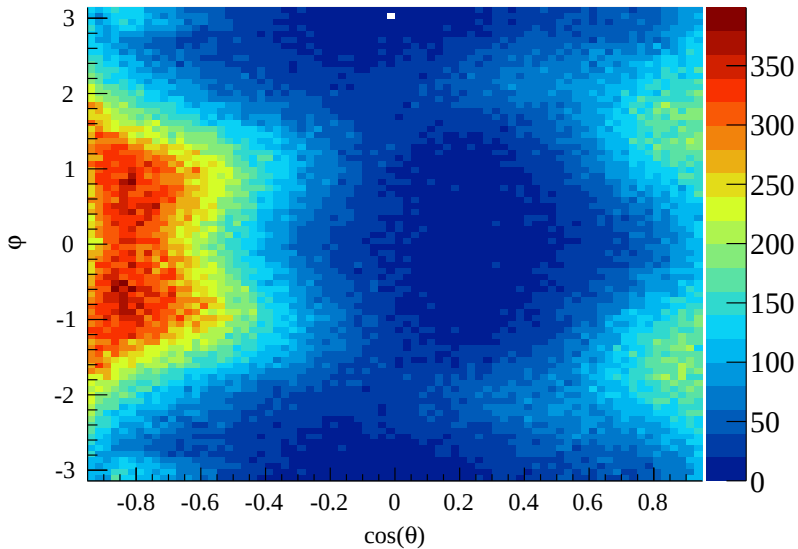
1450 MeV



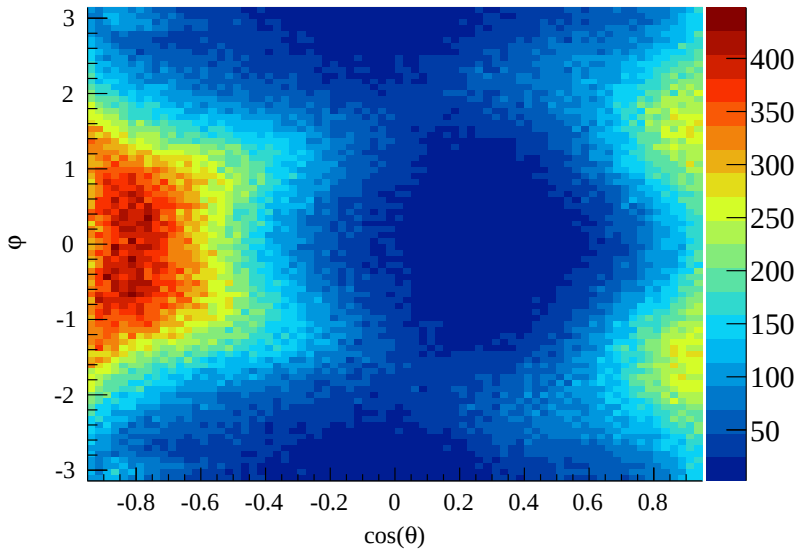
1500 MeV



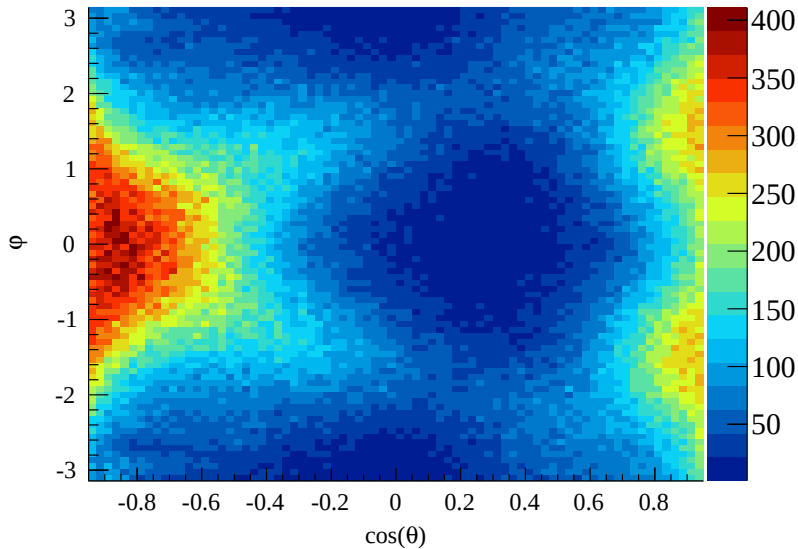
1550 MeV



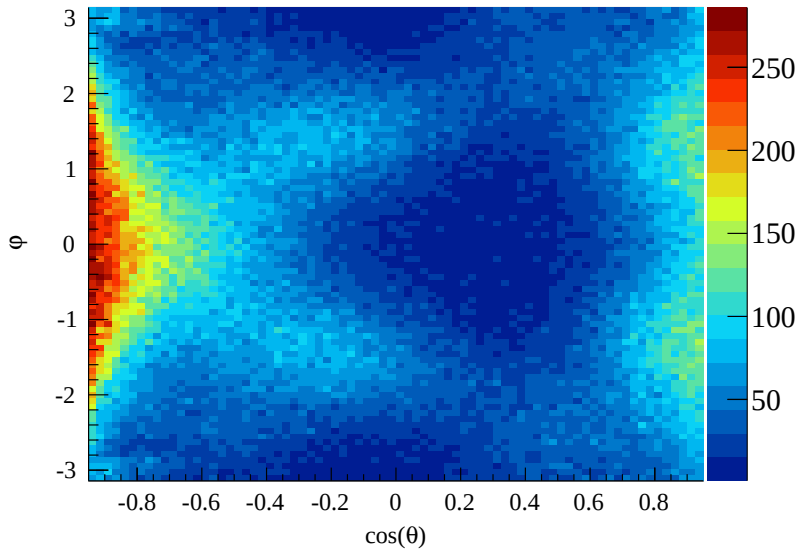
1600 MeV



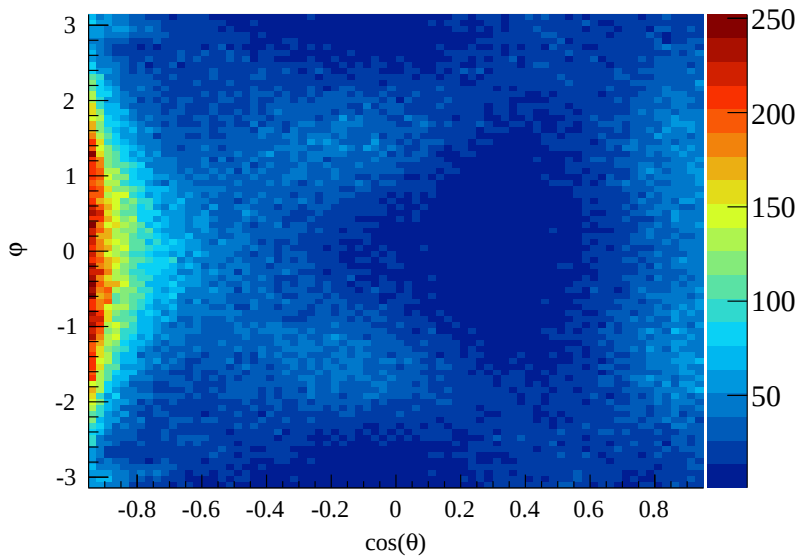
1650 MeV



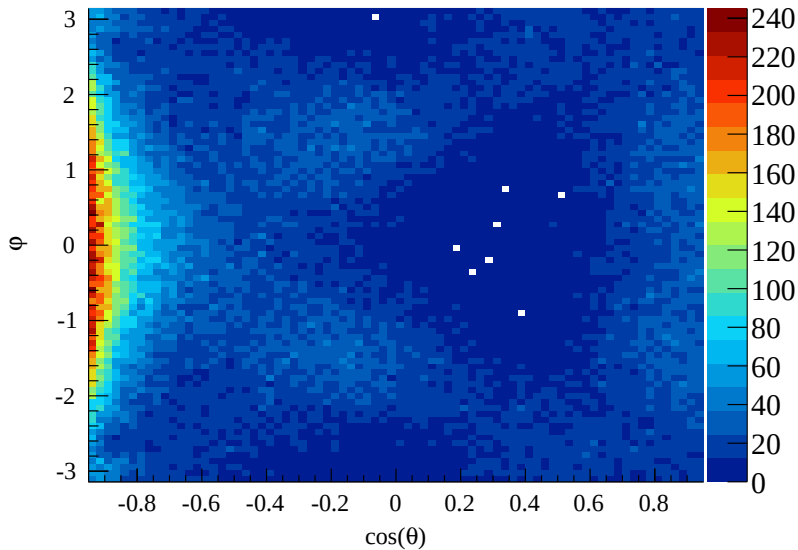
1700 MeV



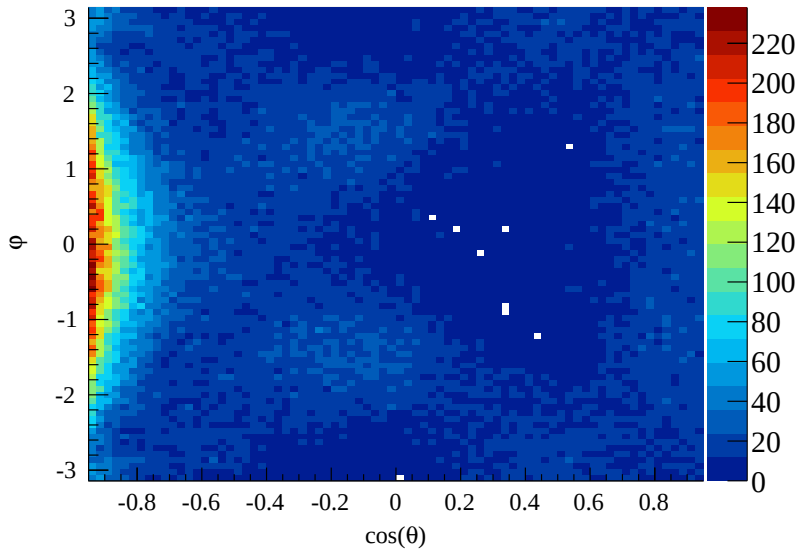
1750 MeV



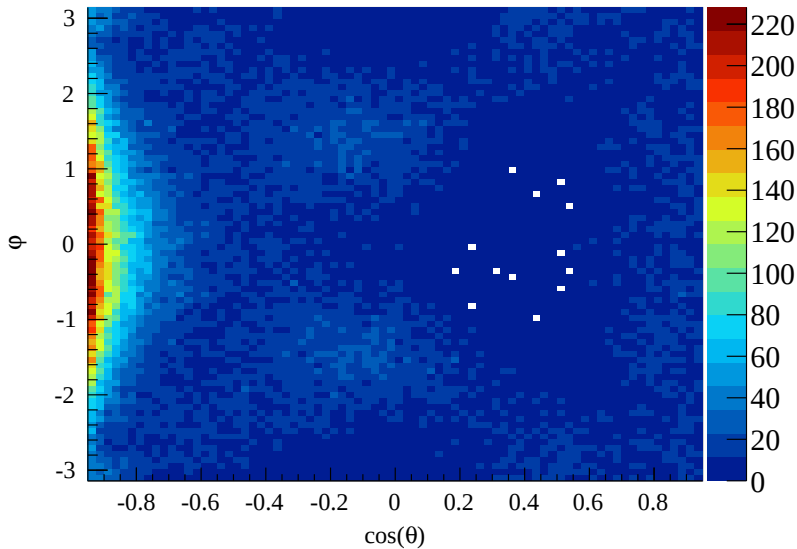
1800 MeV



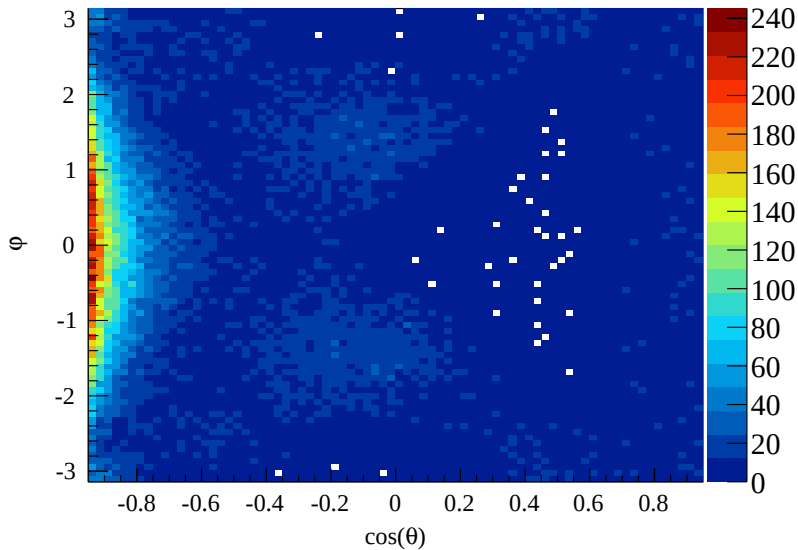
1850 MeV



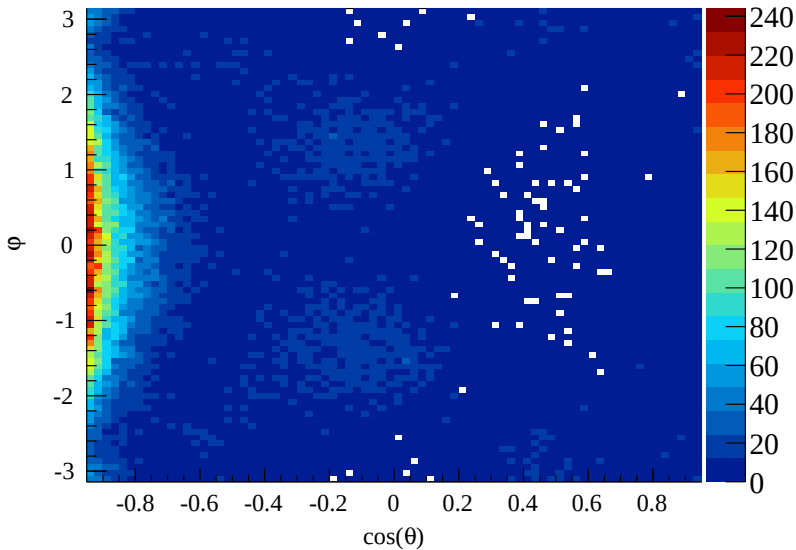
1900 MeV



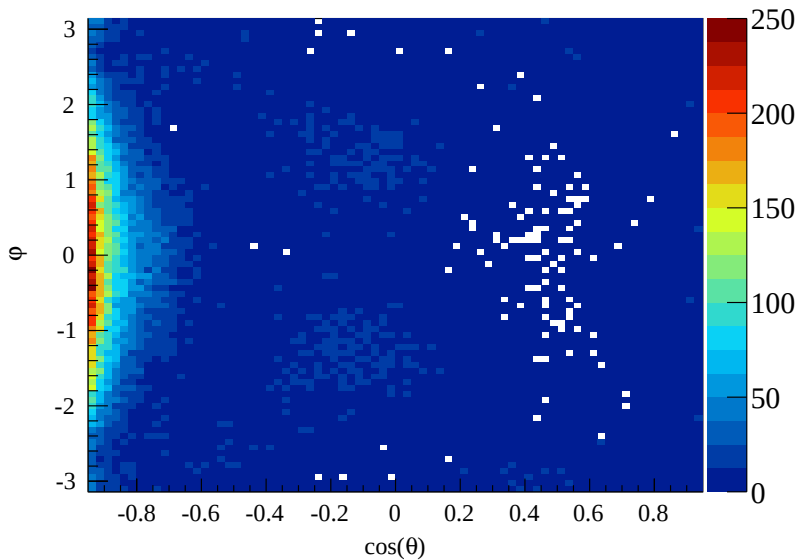
1950 MeV



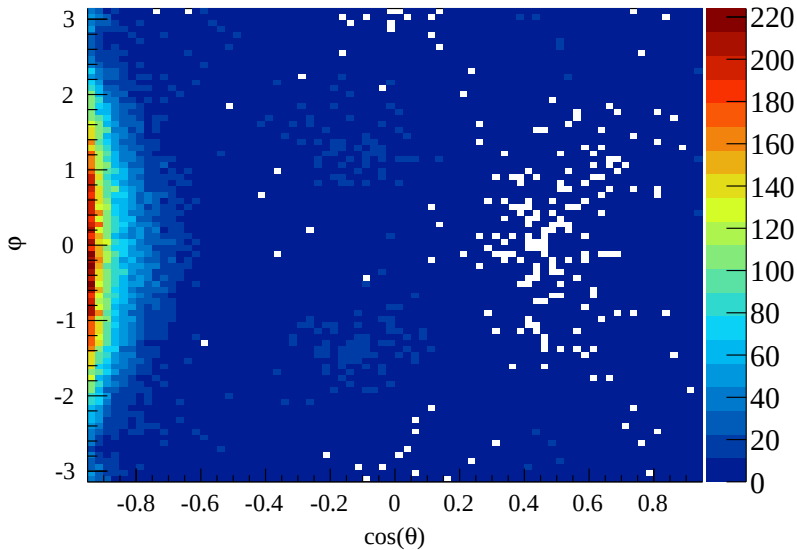
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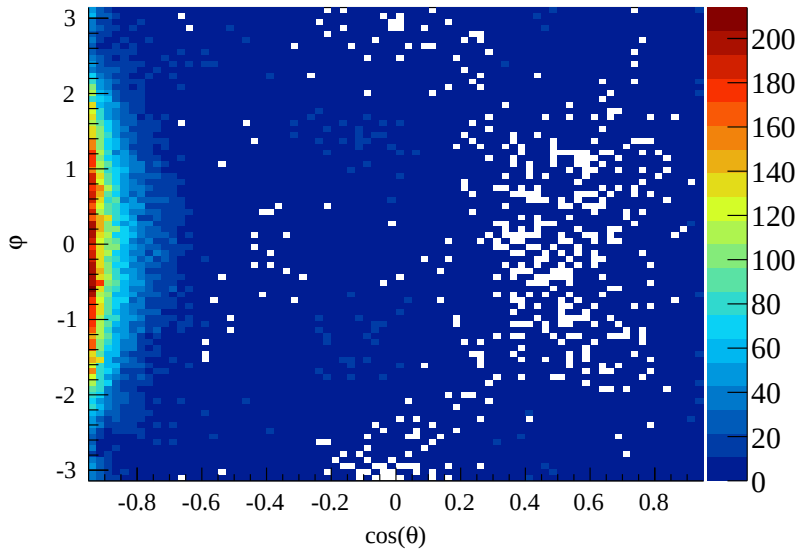
2050 MeV



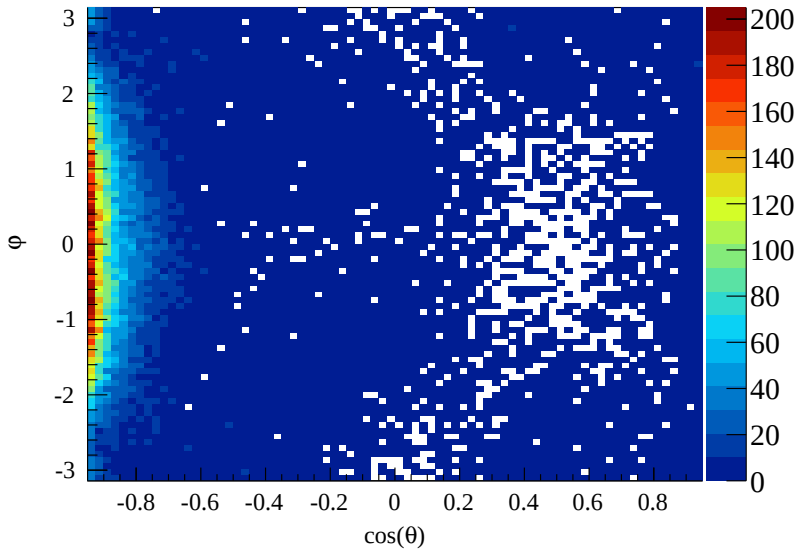
2100 MeV

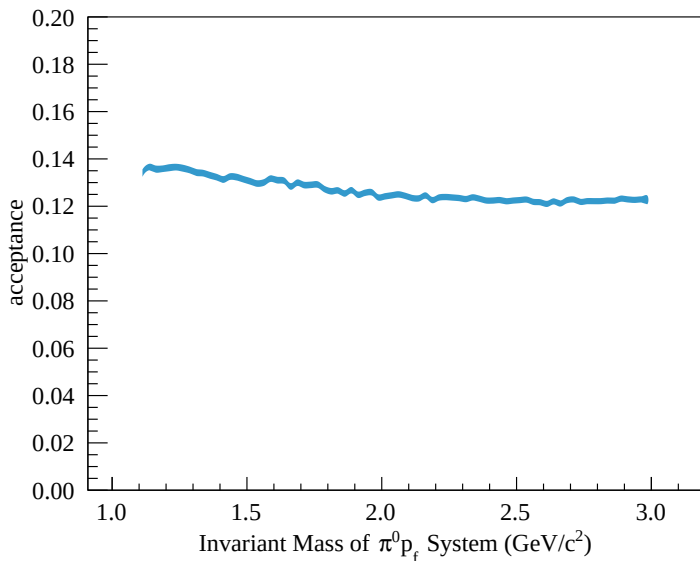


2150 MeV

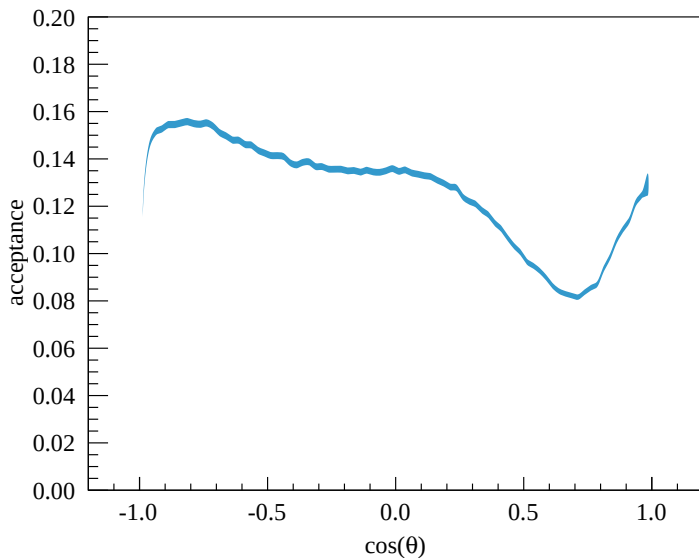


2200 MeV

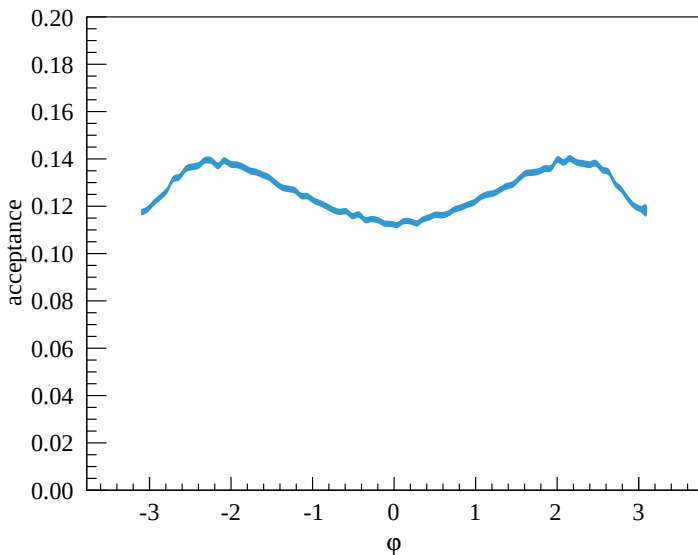


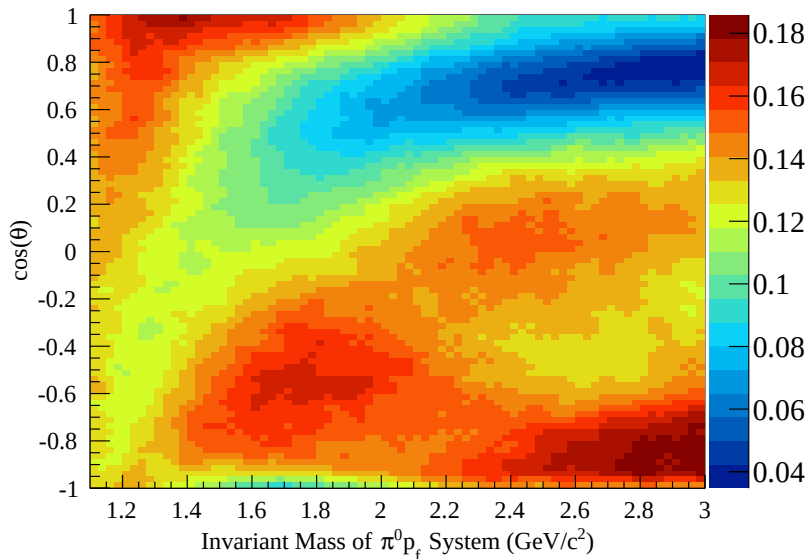
Akzeptanzen π^0 

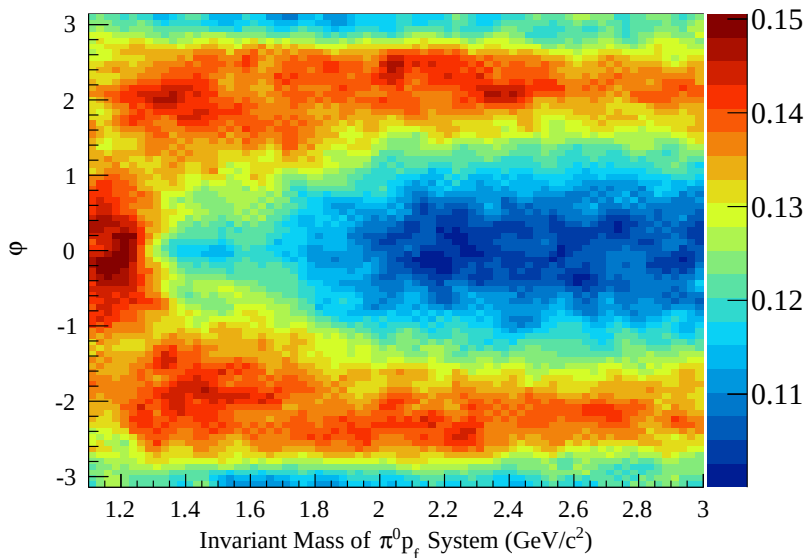
Akzeptanzen π^0



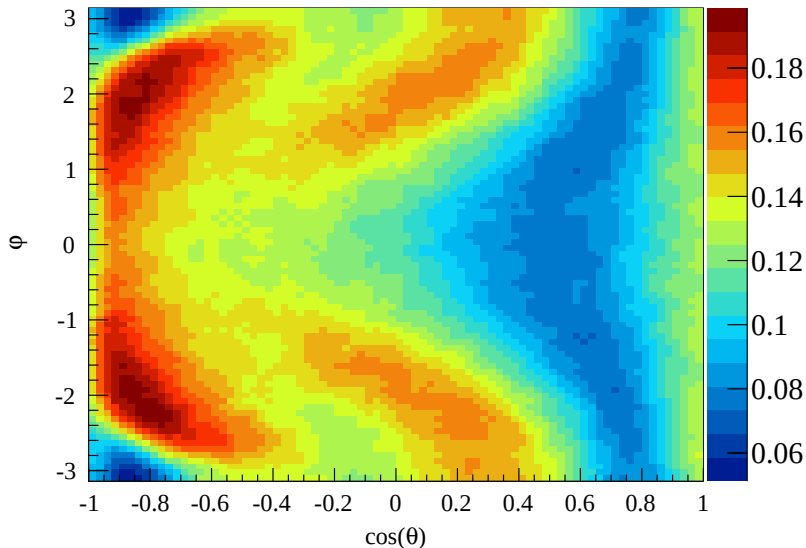
Akzeptanzen π^0



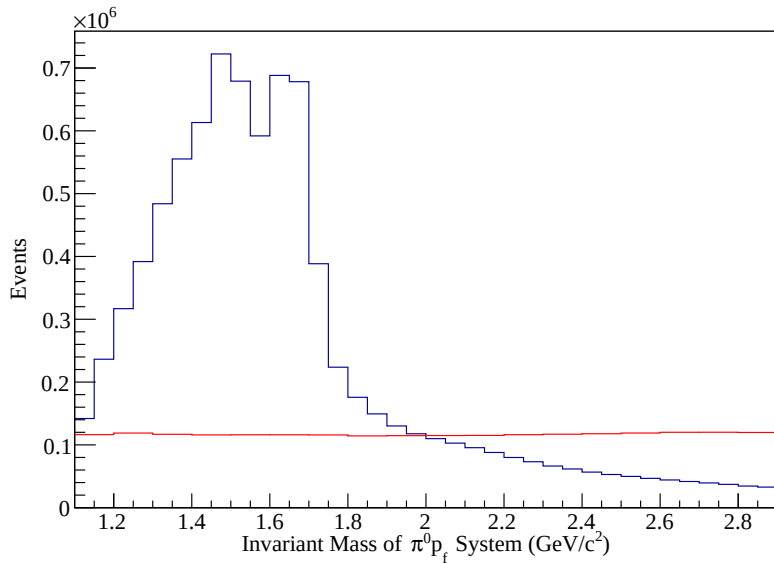
Akzeptanzen π^0 

Akzeptanzen π^0 

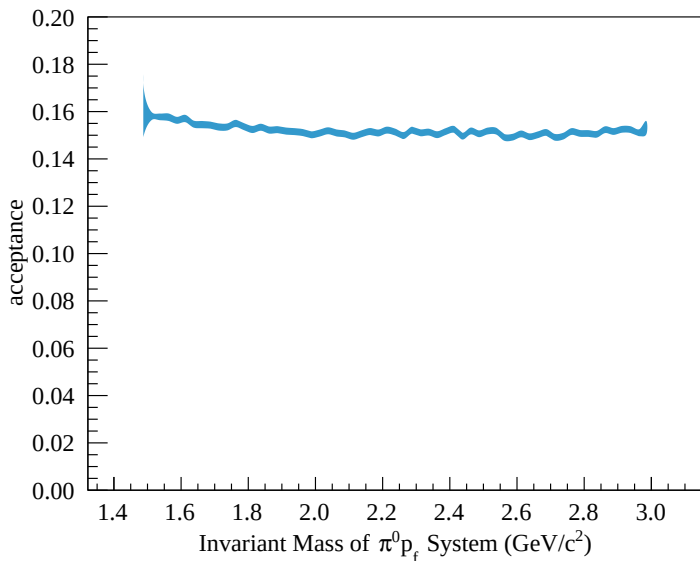
Akzeptanzen π^0



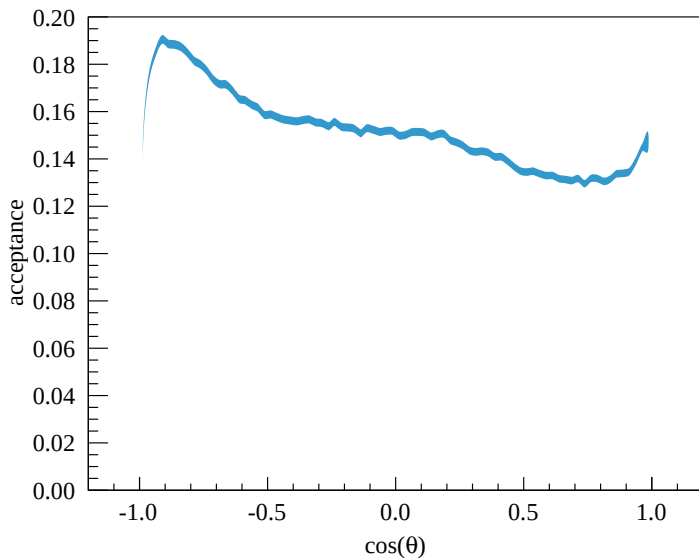
Akzeptanzen π^0



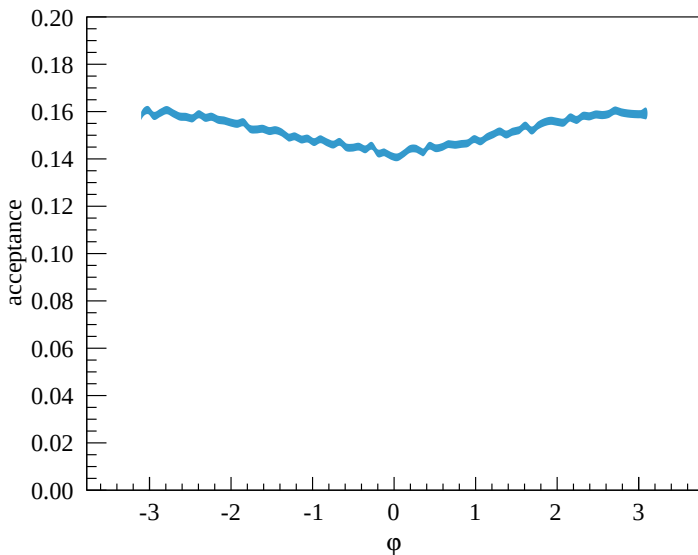
Akzeptanzen η



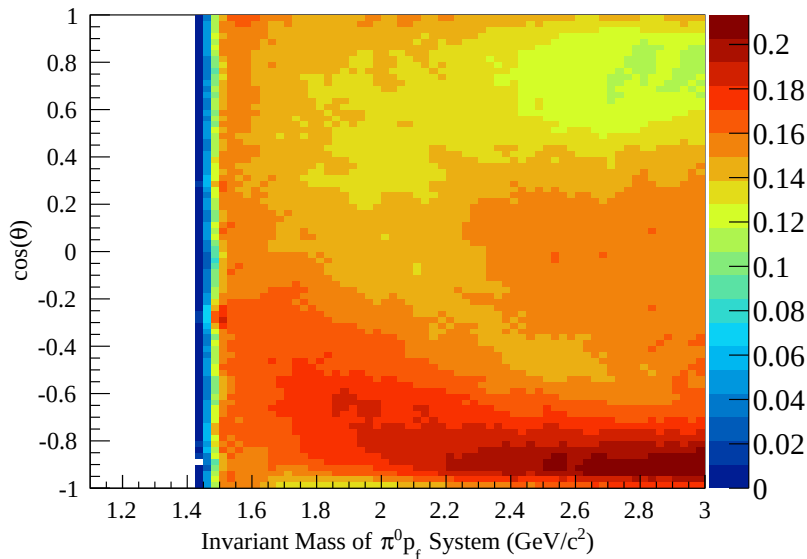
Akzeptanzen η



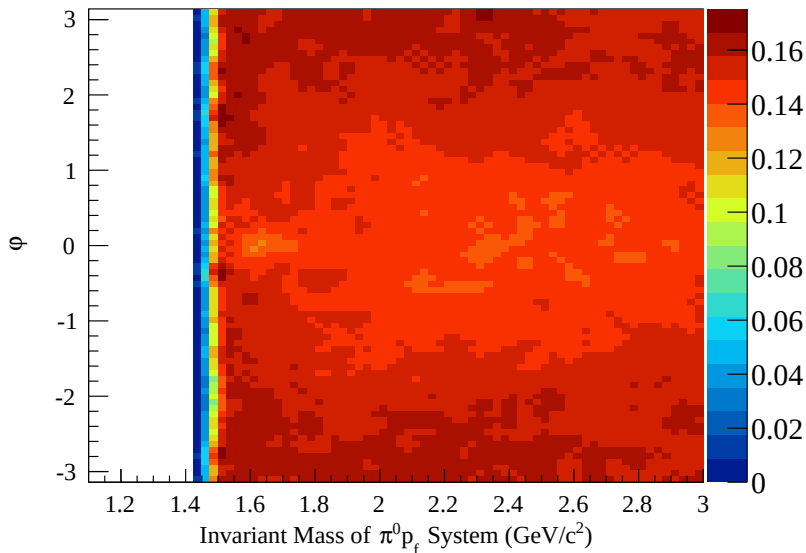
Akzeptanzen η



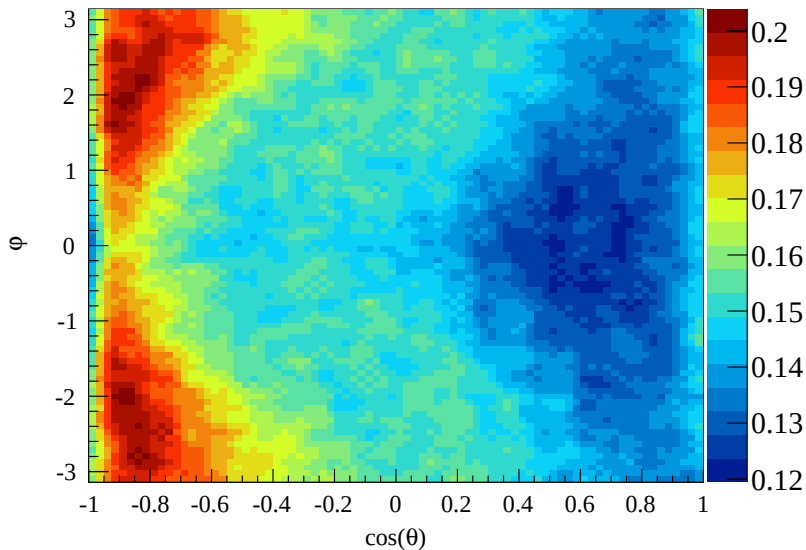
Akzeptanzen η



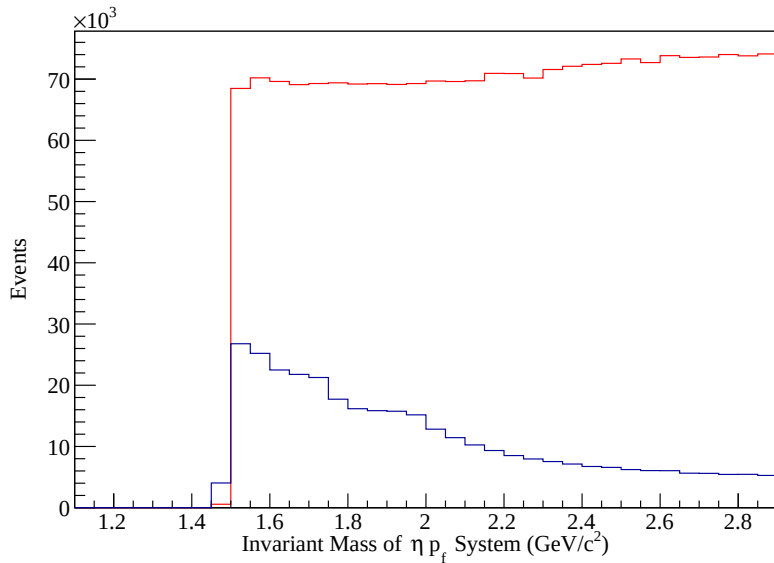
Akzeptanzen η



Akzeptanzen η



Akzeptanzen η



Programmstatus

Codezeilen gesamt:	4840(2511)
davon Header (inkl. Doxygen Dokumentation):	1890(1270)

