

PWA Challenge

Florida International University 2020

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Generated 200000 ($p\eta\pi^0$) events with AmpTools

Generated amplitudes are

- S0/a0 (980 MeV)
- D1/a2 (1320 MeV)
- P1/ π_1 (1400 MeV) (**exotic**)
- G1/a4 (1.995)

J-Spin

M-absolute value of spin projection along z axis

ϵ -reflectivity

J	M	ϵ	Real	Imaginary	BW Mass	BW Width
0	0	-1	2000	0	0.98	0.075
1	1	+1	60	140	1.354	0.330
2	1	+1	1000	0	1.318	0.111
4	1	+1	0	20	1.995	0.257

Results with fitting in different bins of invariant mass of $\eta\pi^0$ and t

D1+

Bin M, t

$M(\eta\pi^0)$ range from 0.7 to 3

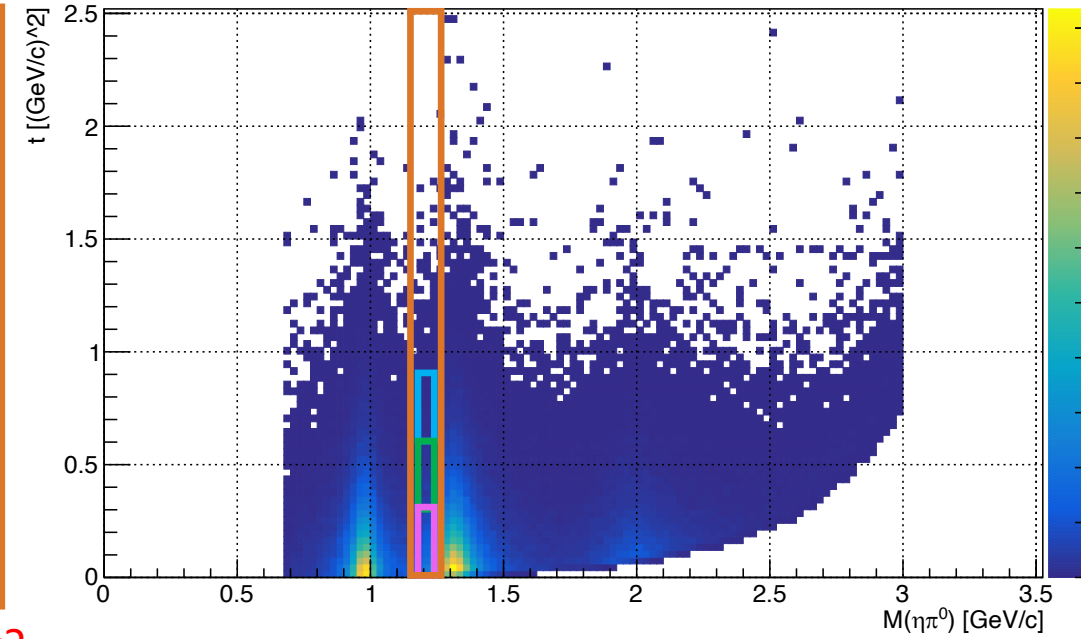
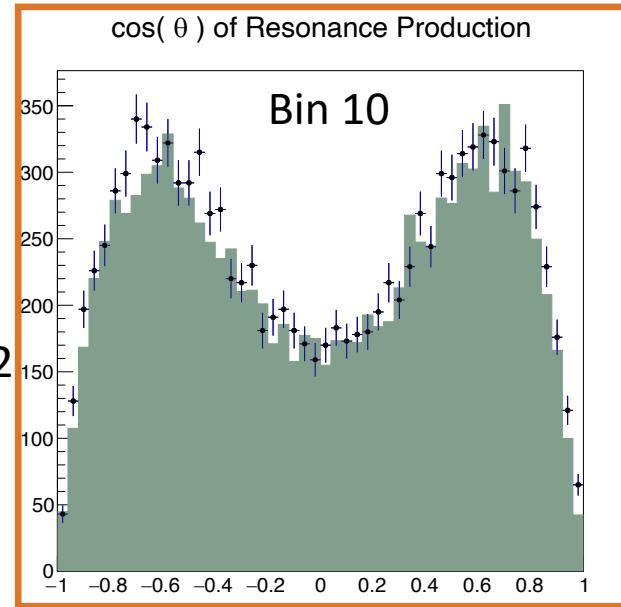
N bins=45

Bin width ≈ 0.051

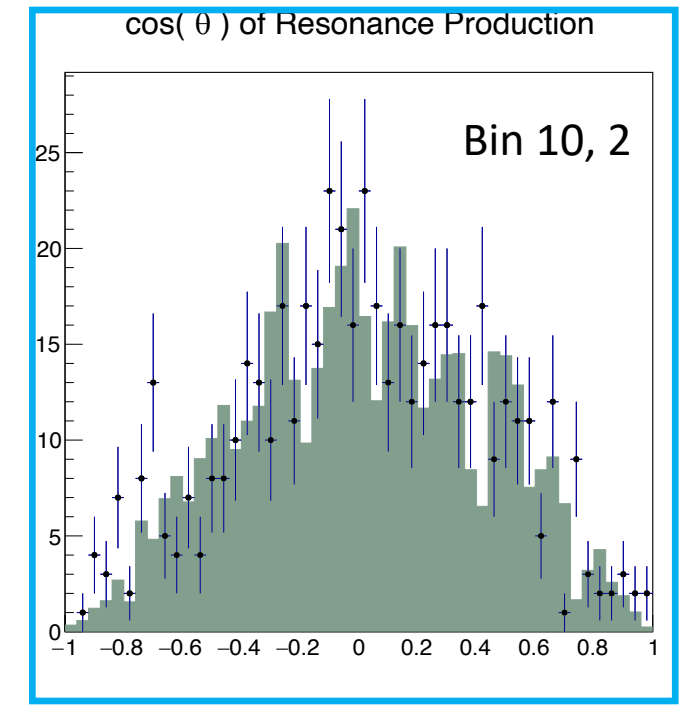
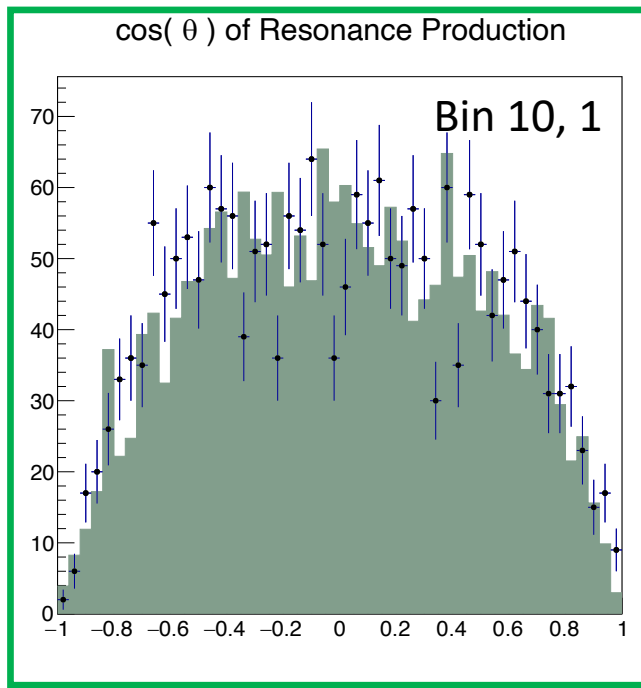
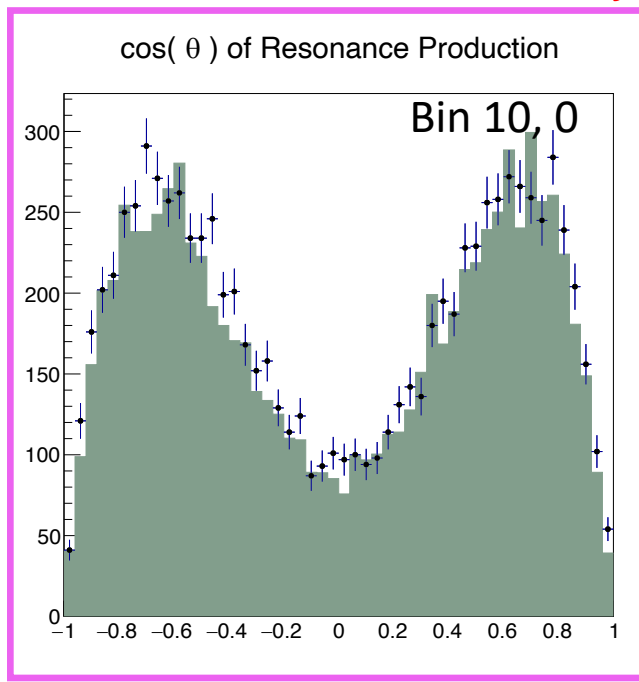
t range from 0 to 1.2

N bins=4

Bin width ≈ 0.3



Why does the shape of the $\cos\theta_{GJ}$ distribution change with increased t ?

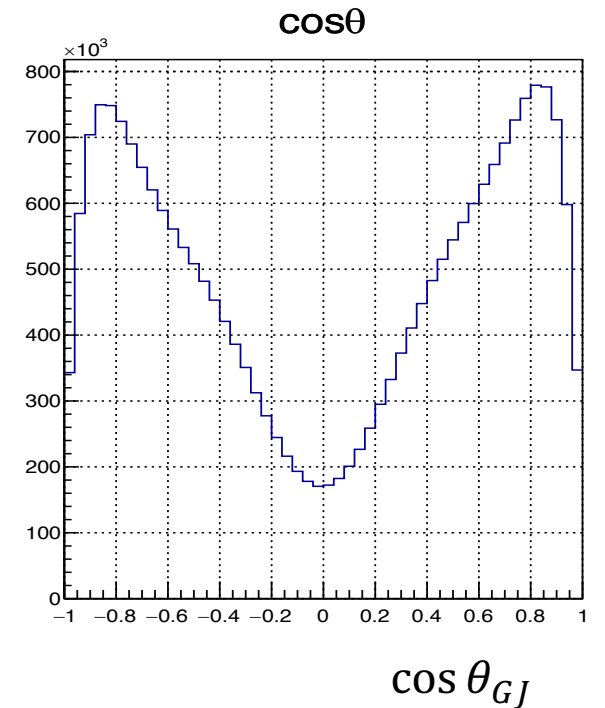
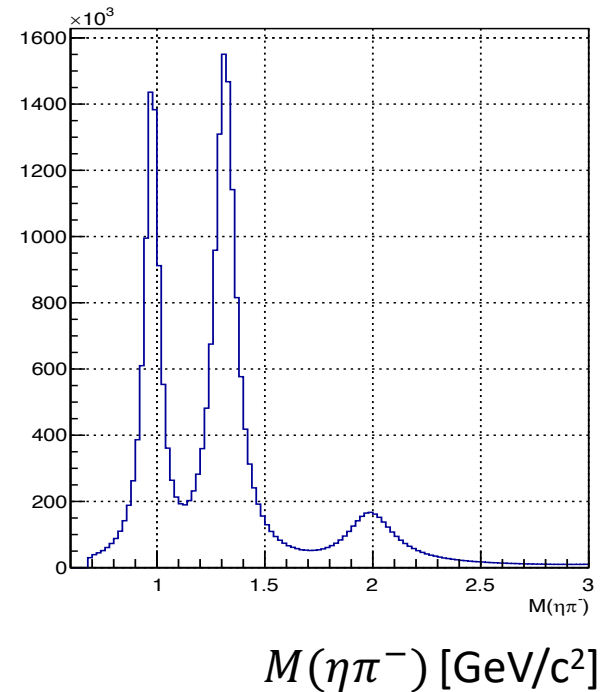
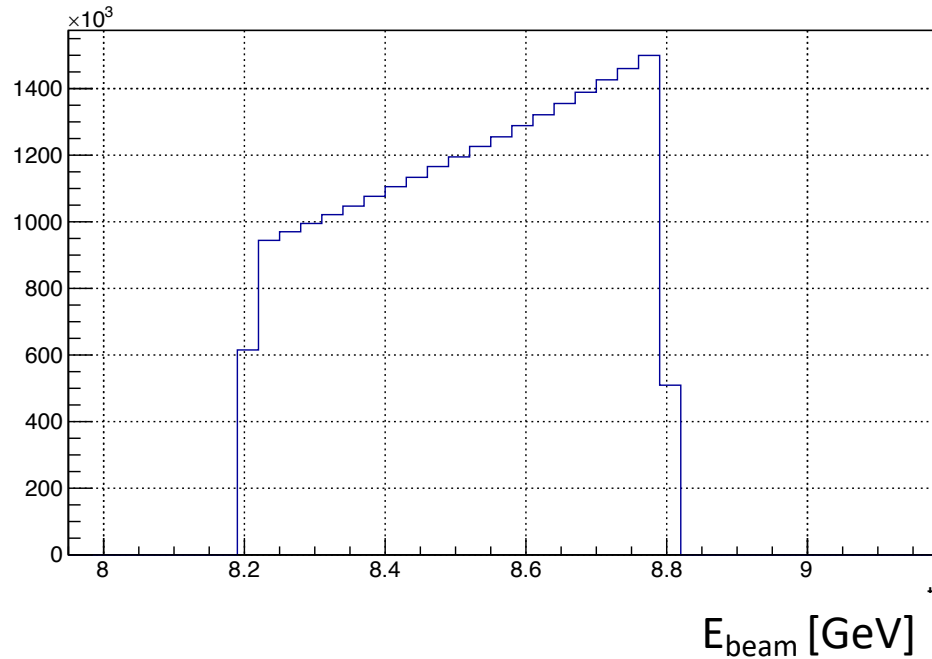


Generated $24 \cdot 10^6$ ($p\eta\pi^0$) events with AmpTools

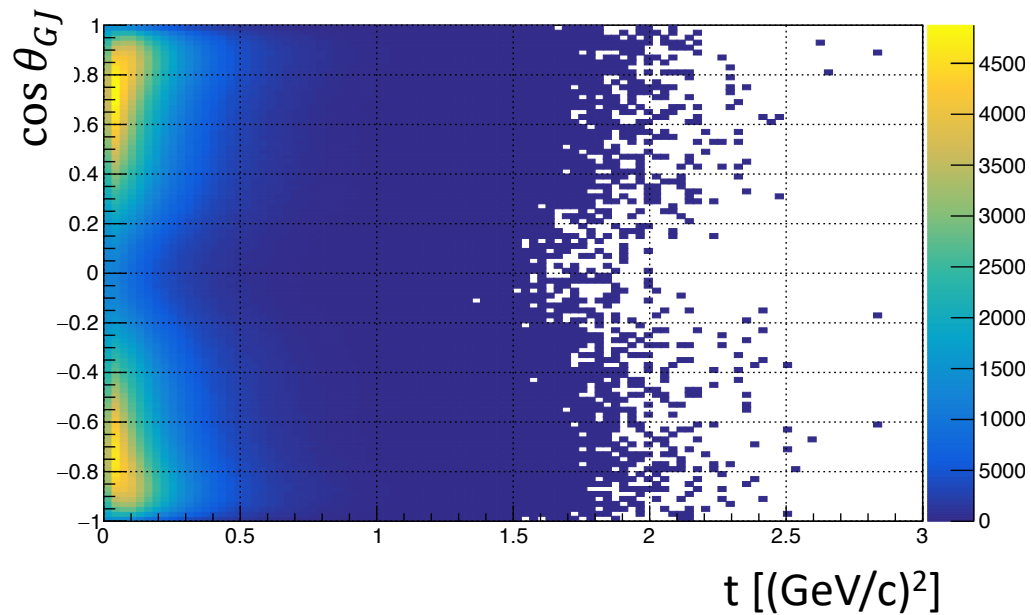
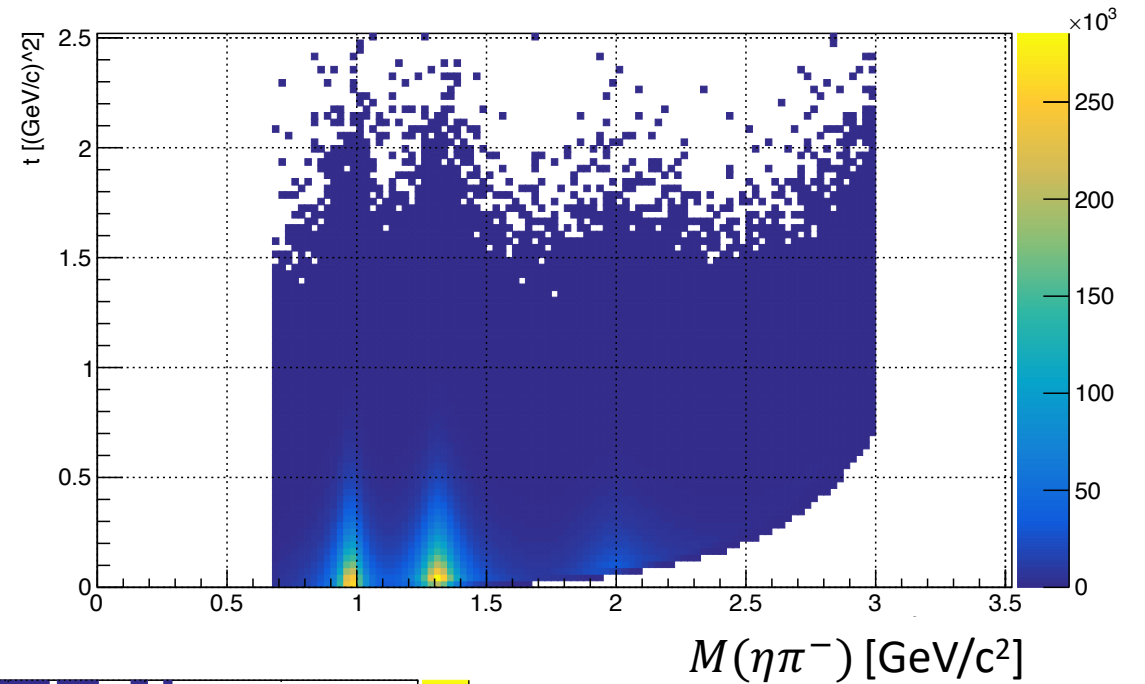
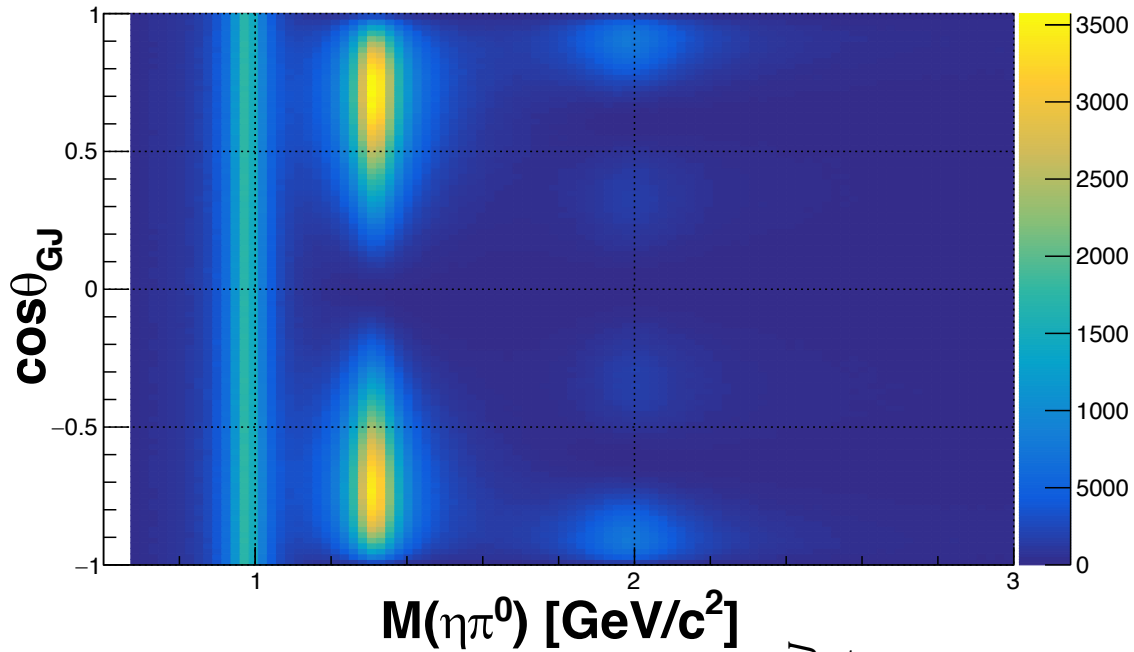
Generated amplitudes are

- S_0/a_0 (980 MeV)
- D_1/a_2 (1320 MeV)
- P_1/π_1 (1400 MeV) (**exotic**)
- G_1/a'_2 (1700)

J	M	ϵ	Real	Imaginary	BW Mass	BW Width
0	0	-1	2000	0	0.98	0.075
1	1	+1	60	140	1.354	0.330
2	1	+1	1000	0	1.318	0.111
4	1	+1	0	20	1.995	0.257

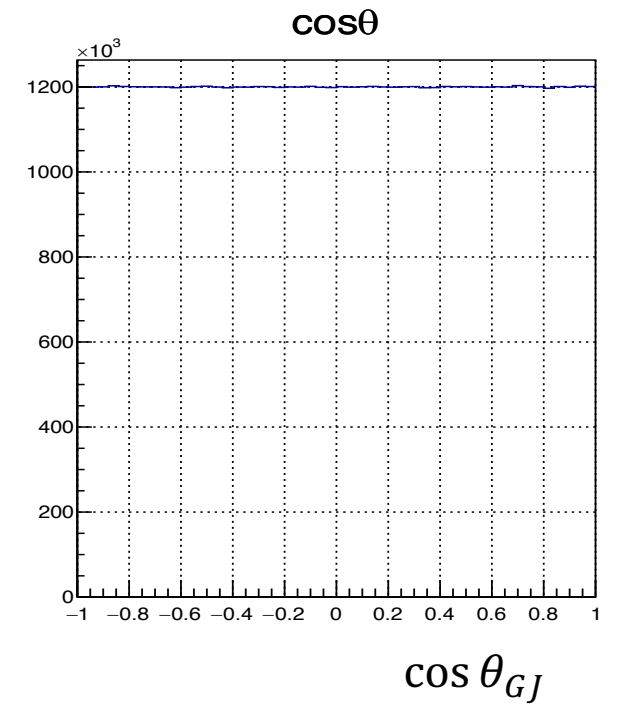
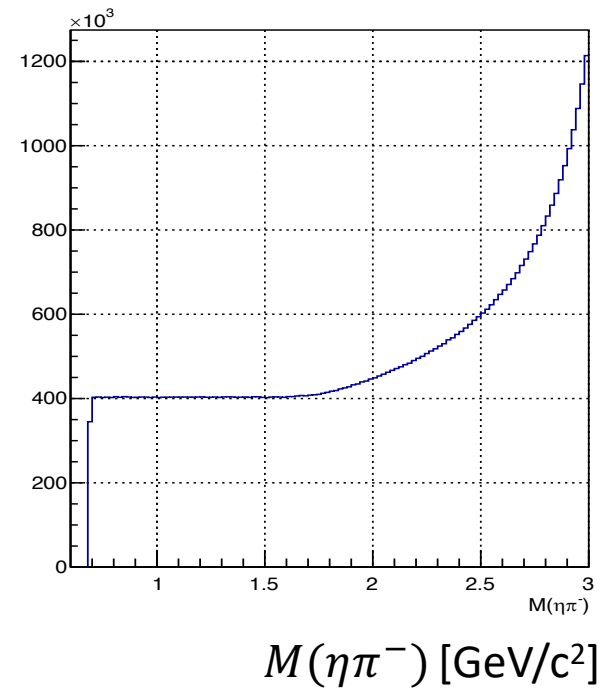
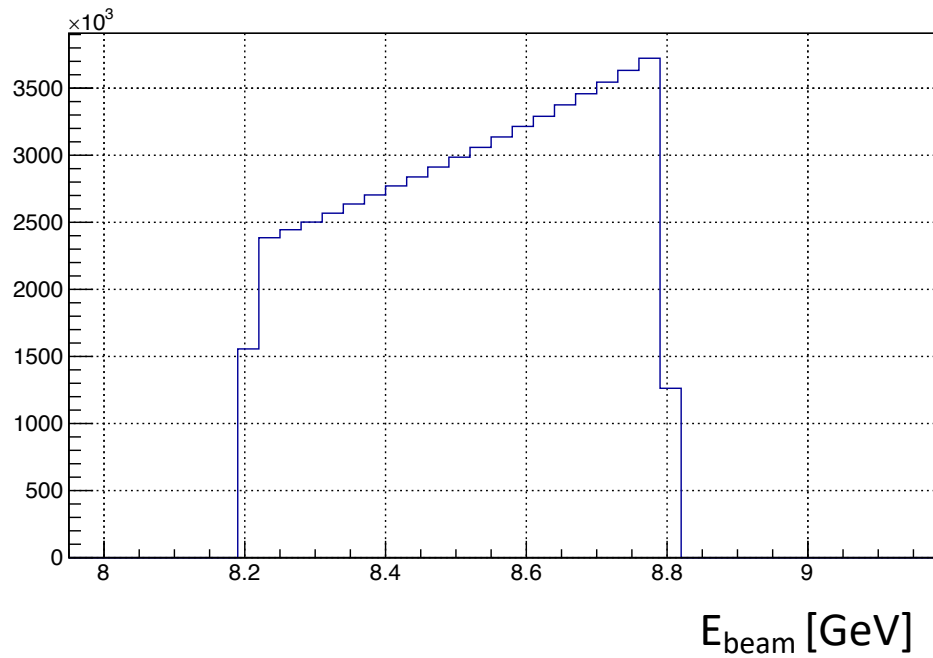


Generated $24 \cdot 10^6$ ($p\eta\pi^0$) events with AmpTools

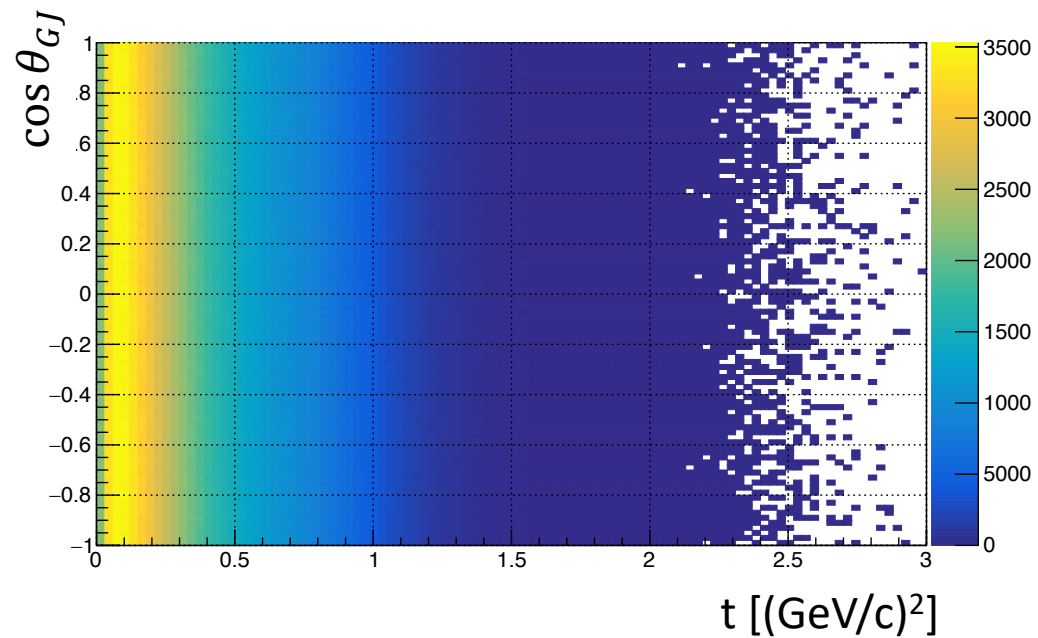
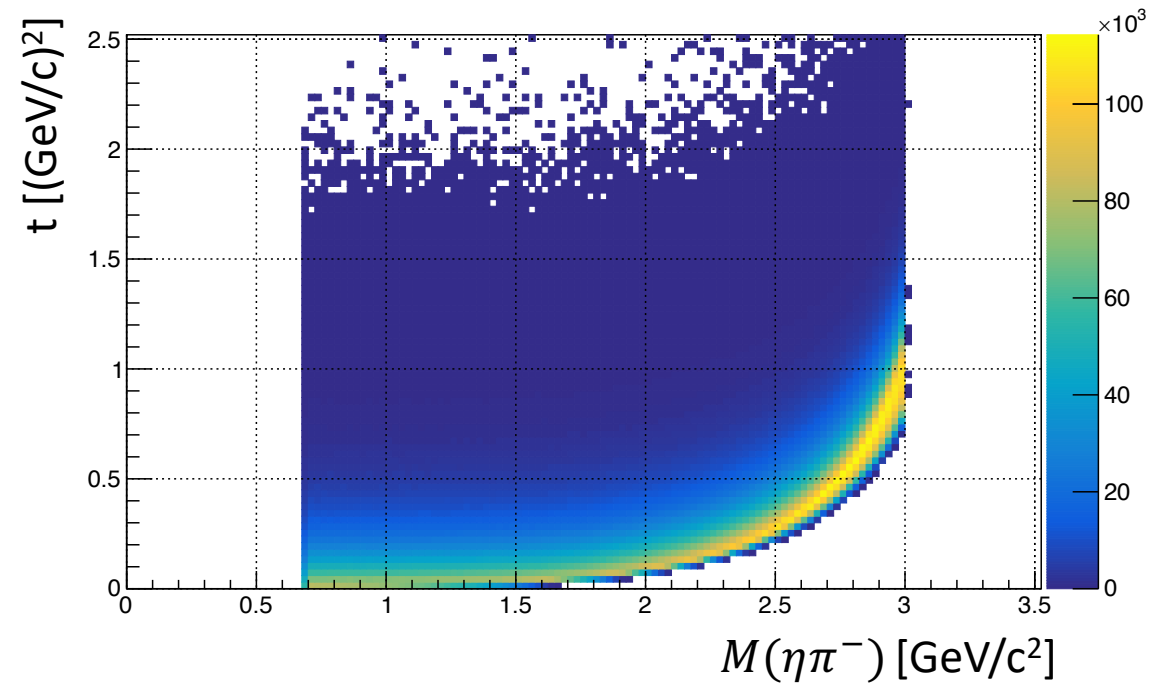
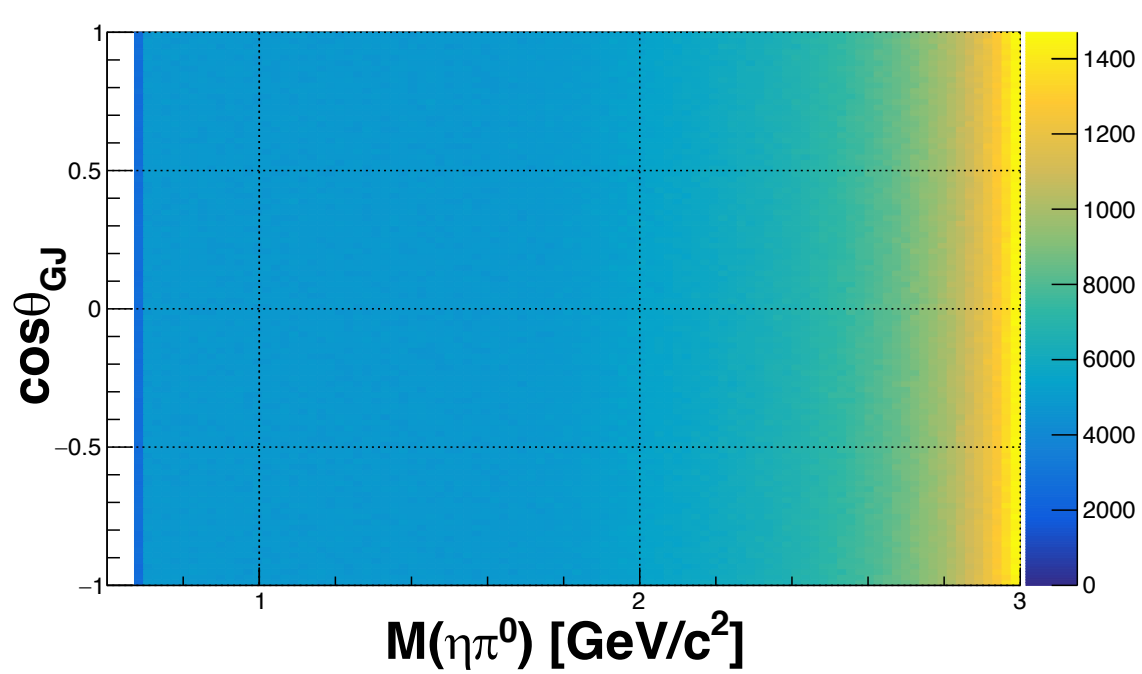


Generated $60 \cdot 10^6$ ($p\eta\pi^0$) flat events with AmpTools

- Flat in $\cos \theta_{GJ}$
- Flat in $M(\eta\pi^-)$



Generated $24 \cdot 10^6$ ($p\eta\pi^0$) \sqrt{s} events with AmpTools



Results with fitting in different bins of invariant mass of $\eta\pi^0$ and t

D1+

Bin M, t

$M(\eta\pi^0)$ range from 0.7 to 3

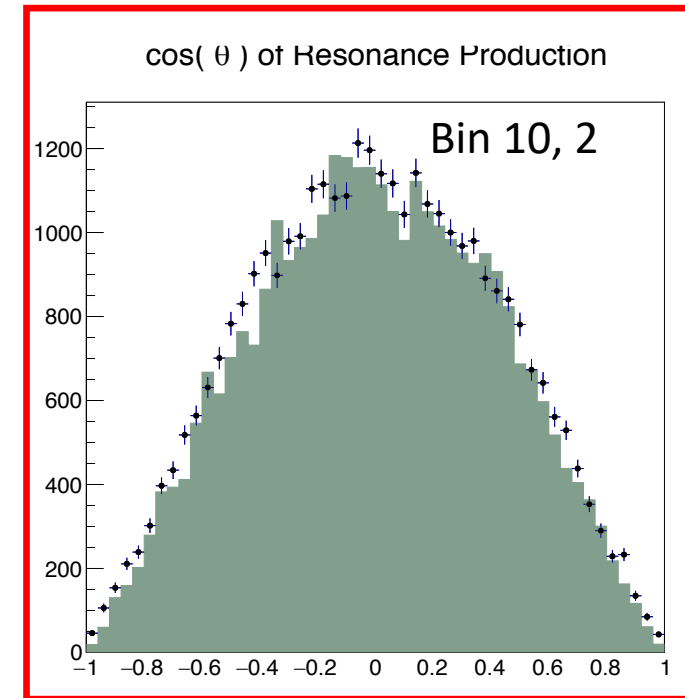
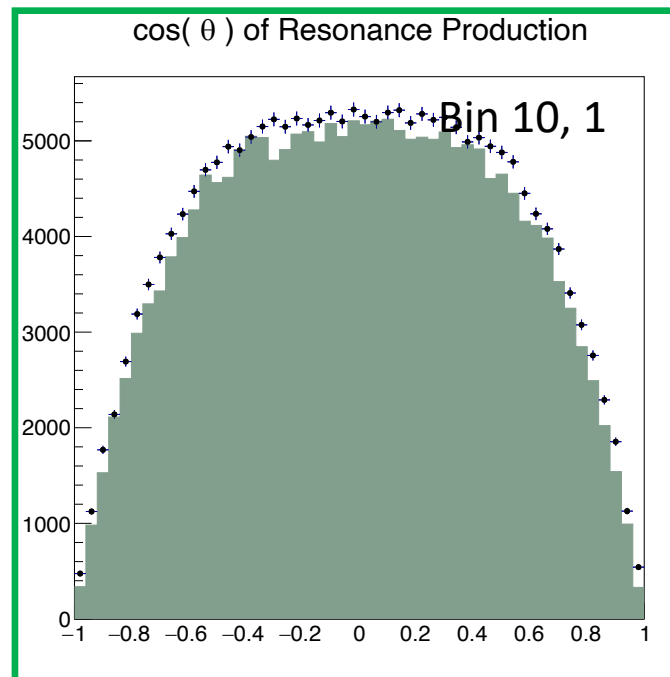
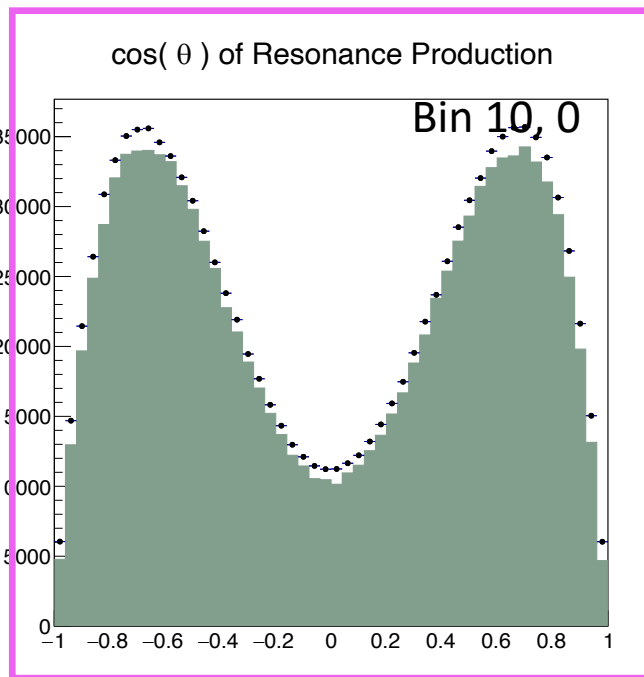
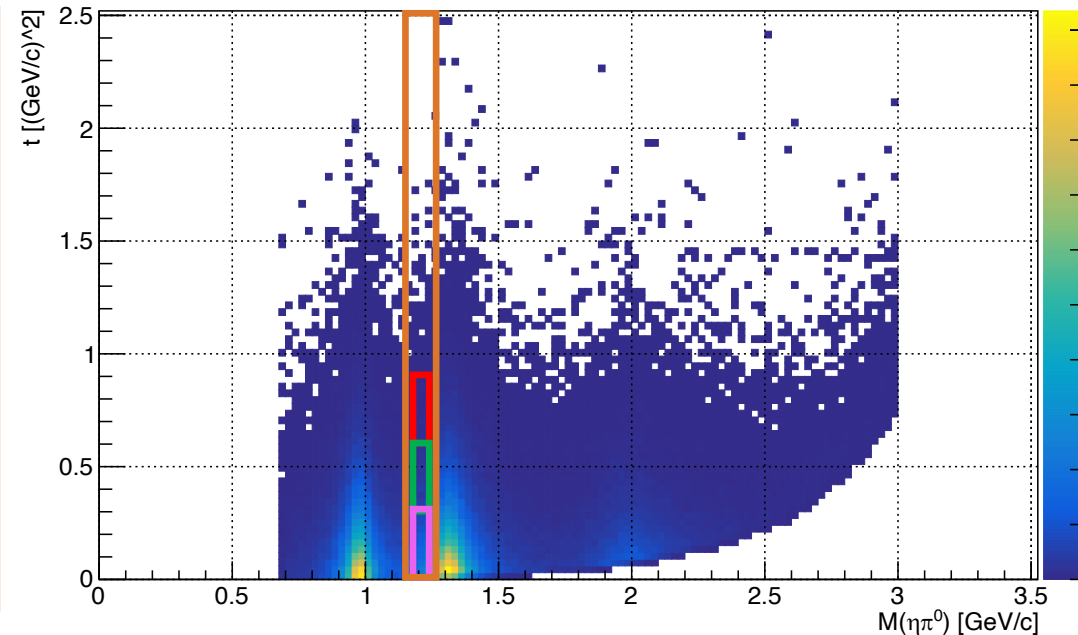
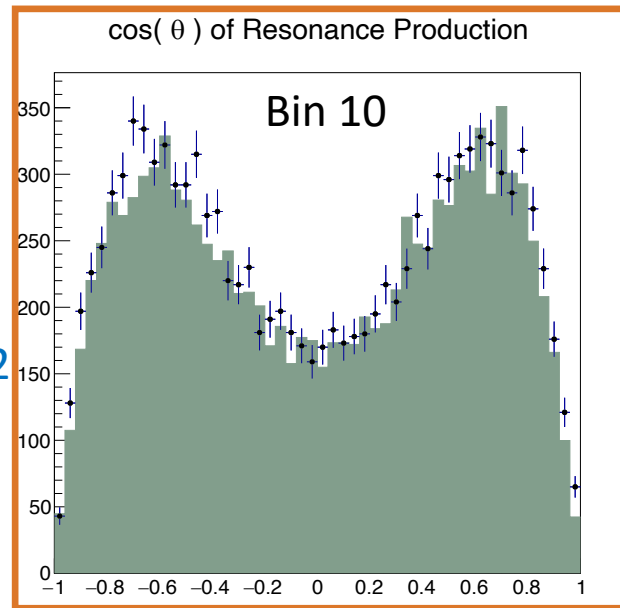
N bins=45

Bin width ≈ 0.051

t range from 0 to 1.2

N bins=4

Bin width ≈ 0.3



Results with fitting in different bins of invariant mass of $\eta\pi^0$ and t ($4 \cdot 10^6$ events)

Bin 10, 0

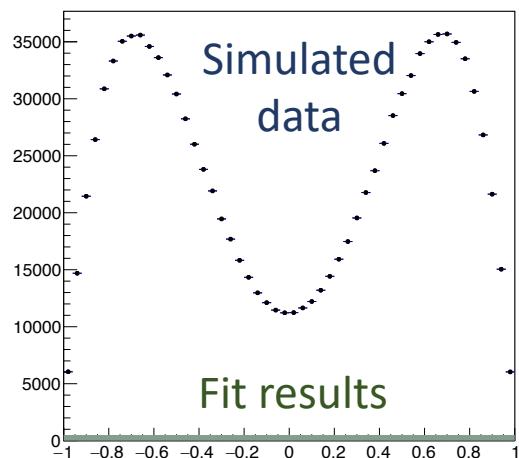
S0-

P0-

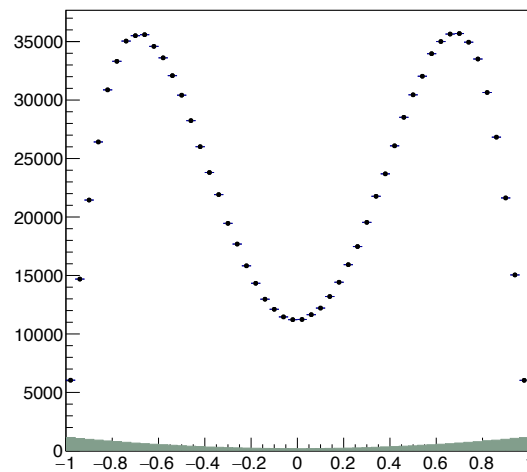
P1-

P1+

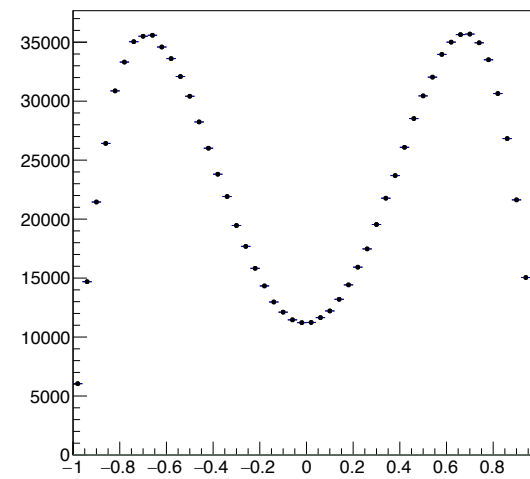
cos(θ) of Resonance Production



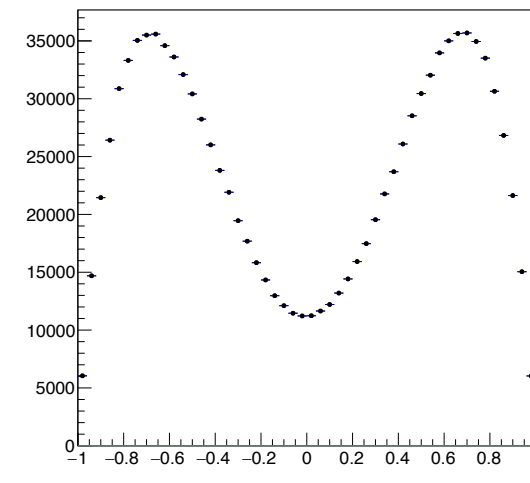
cos(θ) of Resonance Production



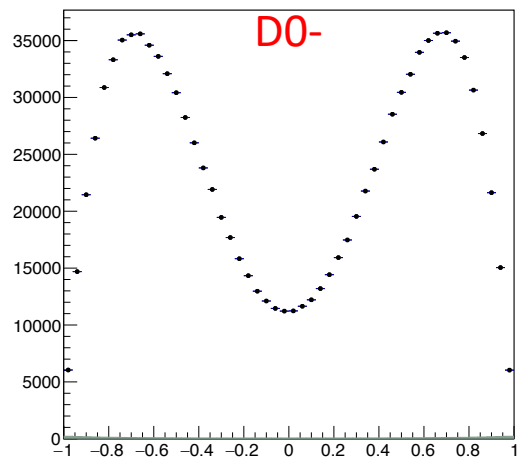
cos(θ) of Resonance Production



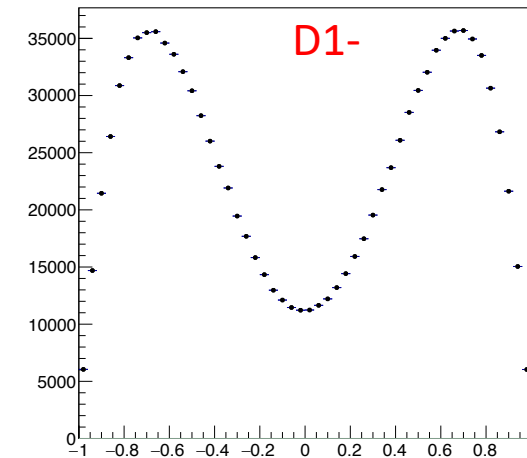
cos(θ) of Resonance Production



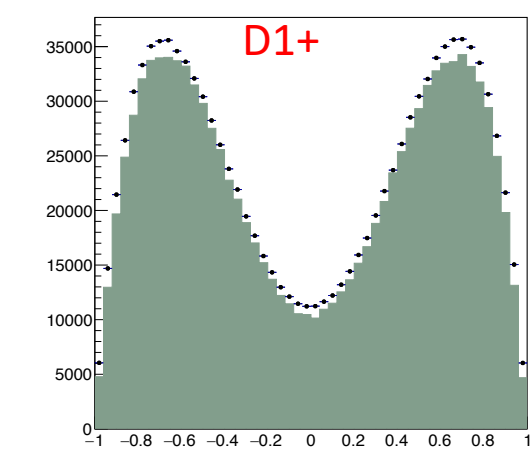
cos(θ) of Resonance Production



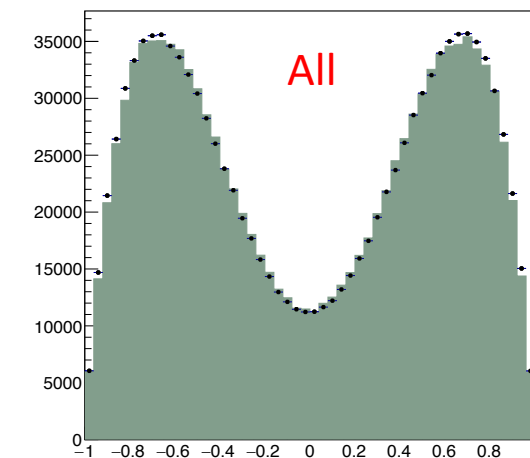
cos(θ) of Resonance Production



cos(θ) of Resonance Production



cos(θ) of Resonance Production

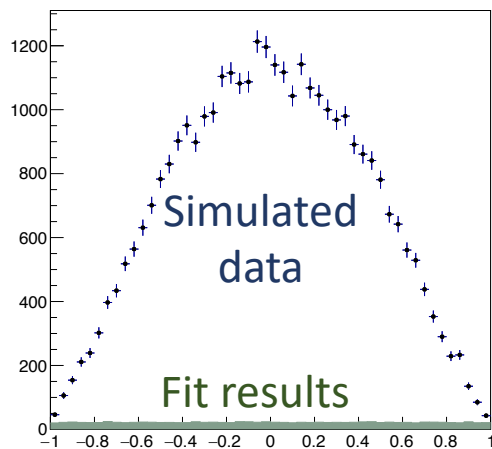


Results with fitting in different bins of invariant mass of $\eta\pi^0$ and t ($4 \cdot 10^6$ events)

Bin 10, 2

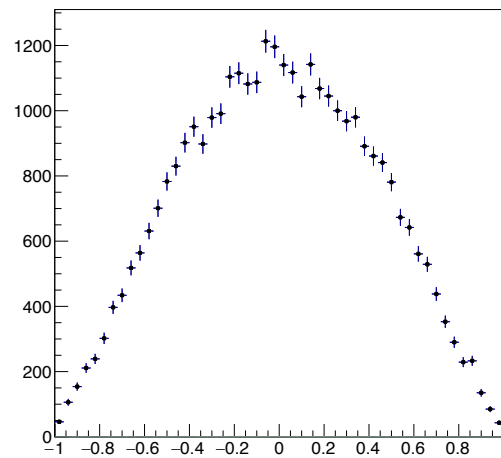
S0-

cos(θ) of Resonance Production



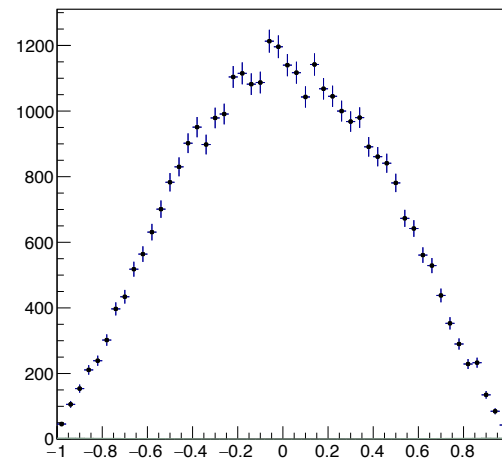
P0-

cos(θ) of Resonance Production



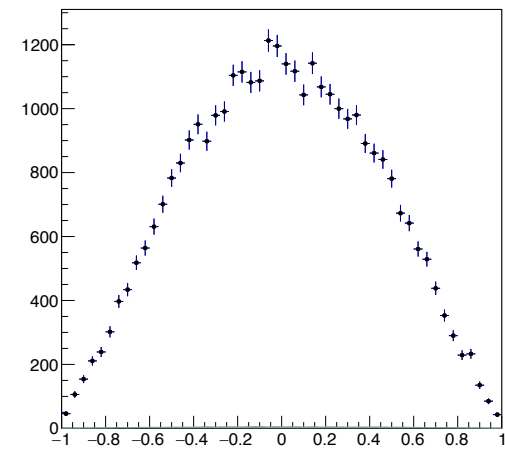
P1-

cos(θ) of Resonance Production



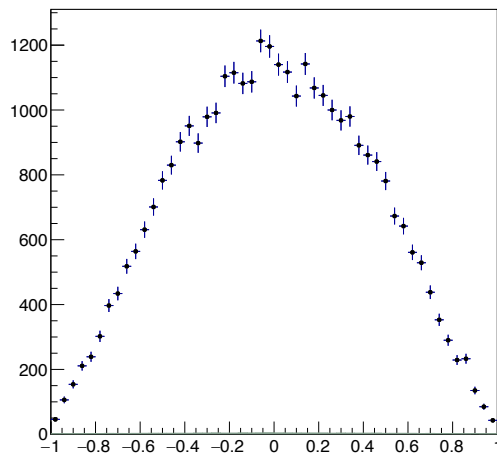
P1+

cos(θ) of Resonance Production



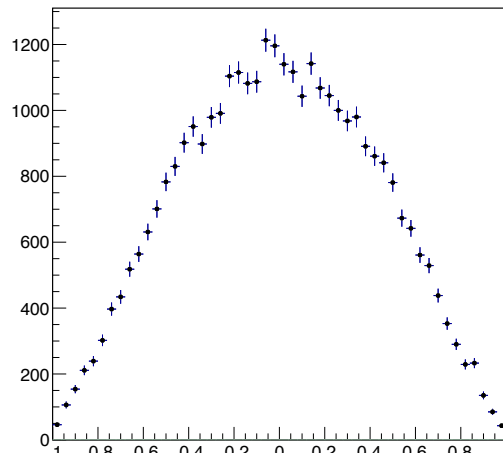
D0-

cos(θ) of Resonance Production



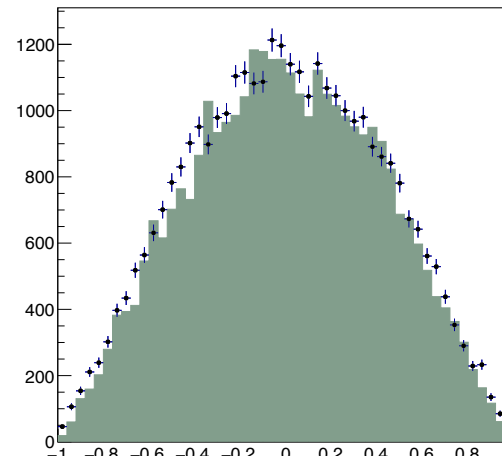
D1-

cos(θ) of Resonance Production



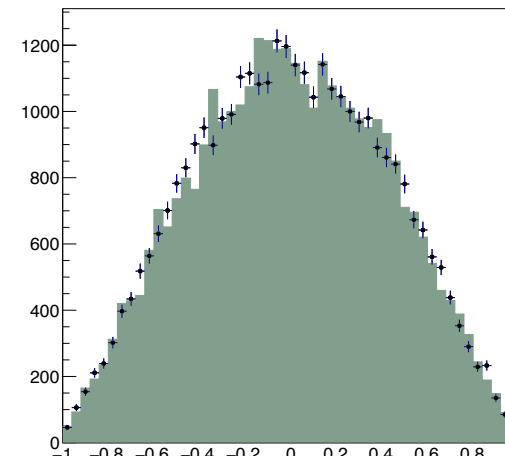
D1+

cos(θ) of Resonance Production



All

cos(θ) of Resonance Production



Results with fitting in different bins of invariant mass of $\eta\pi^0$ and t ($4 \cdot 10^6$ events)

All bins

