

Amplitude analysis of GlueX phase 1
($p\eta'\pi^0$) data using waveset from Tensor
Meson Dominance model for a_2
photoproduction

Florida International University 2021

Mariana Khachatryan

1. Fitting entire GlueX phase 1 data (adding fall 2018) for four γ polarization plane angles relative to horizontal (0, 45, 90, 135^o) + amorphous data using loop statement in AmpTools
2. Fit intensity with a waveset that includes S, D waves, where we include only certain M and ϵ values for D waves that are expected to have nonzero contribution based on Vincents TMD model (Tensor Meson Dominance):
 - $S_0^{(+)}, S_0^{(-)}, D_0^{(+)}, D_1^{(+)}, D_2^{(+)}, D_{-1}^{(-)}, D_0^{(-)}, D_1^{(-)}$

$$s = m_N^2 + 2m_N E_\gamma, E_\gamma = 8.5 \text{ GeV and } t = -0.2 \text{ GeV}^2,$$

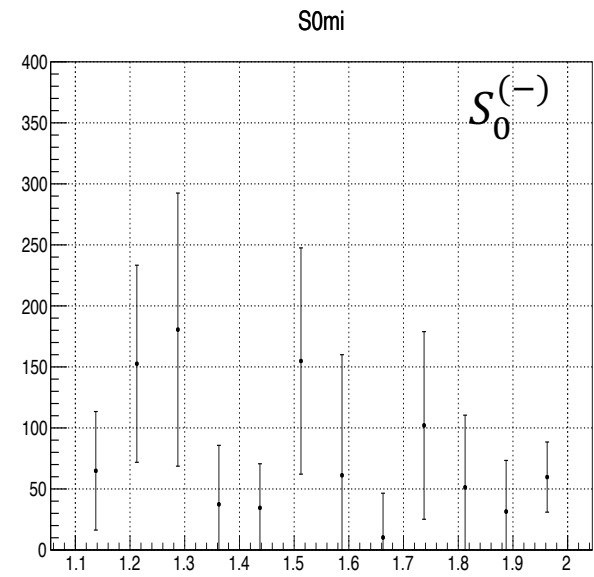
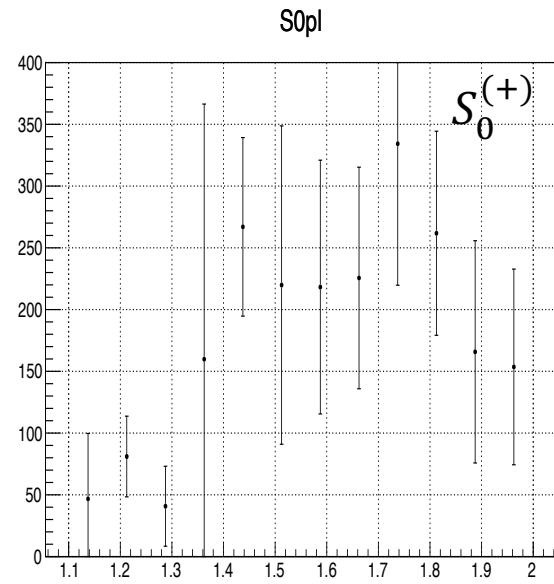
$$\begin{array}{lll} {}^{(+)}[D]_{m=2} = 2.35 & {}^{(+)}[D]_{m=1} = 0.82 & {}^{(+)}[D]_{m=0} = 0.11 \\ {}^{(-)}[D]_{m=1} = 0.84 & {}^{(-)}[D]_{m=0} = 0.45 & {}^{(-)}[D]_{m=-1} = 0.09 \end{array}$$

Photoproduction of $a_2(1320) \rightarrow \eta\pi^0$
 Vincent Mathieu
 May 26, 2021

3. Invariant mass bin size of 75 MeV/c², momentum transfer bin size of 0.6 (GeV/c)²
4. Hopefully, the increased statistics and decreased number of fit parameters will allow to also calculate uncertainties from bootstrapping method

Plot acceptance uncorrected results

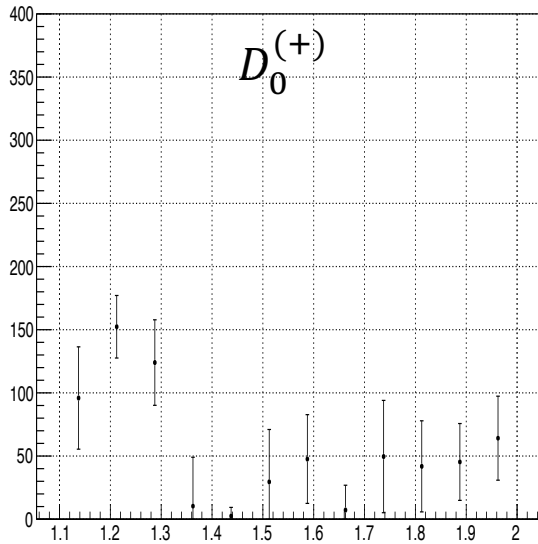
Acceptance uncorrected



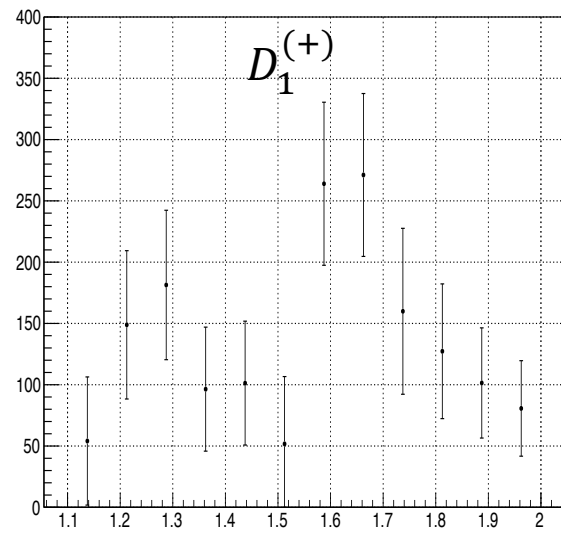
Fit with $S_0, P_{0,1}, D_{0,1,2}$ $\varepsilon = \pm 1$

Acceptance uncorrected

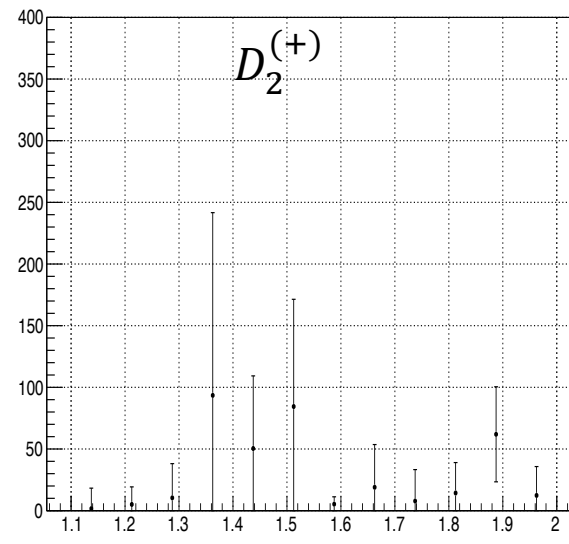
D0pl



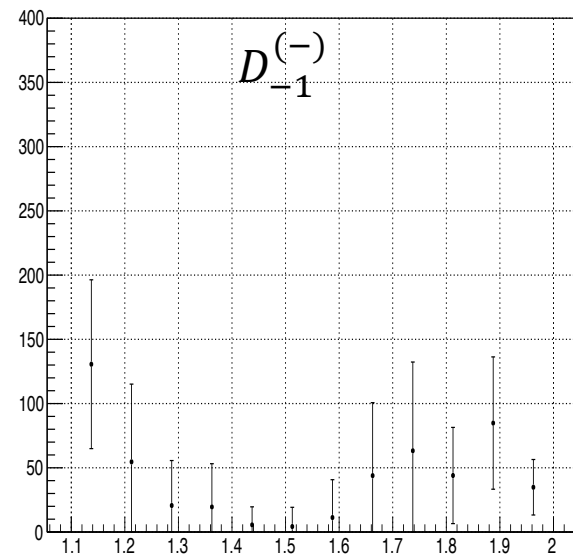
D1p



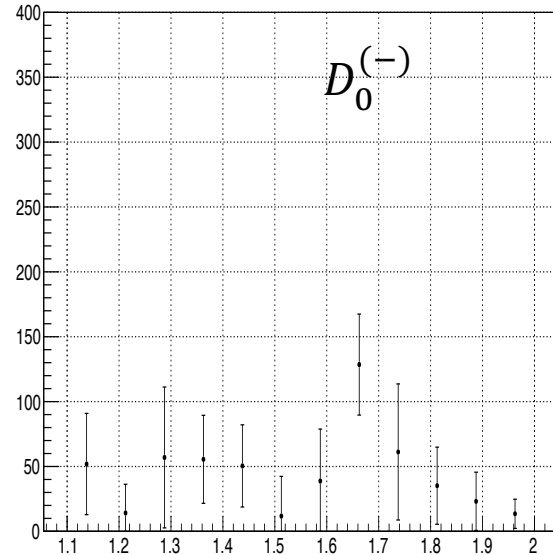
D2pl



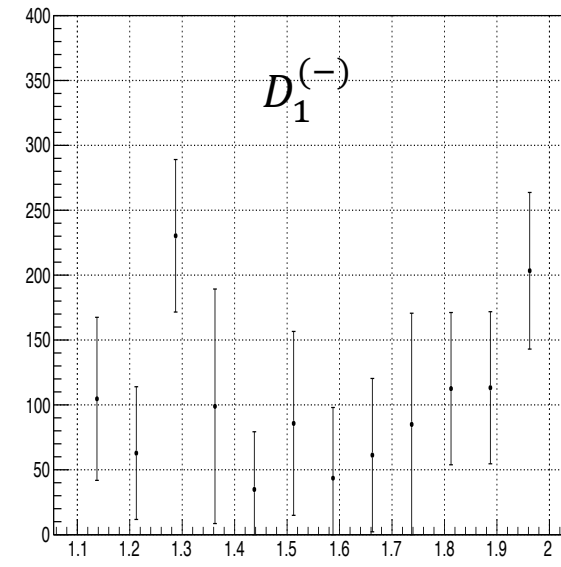
Dmi1mi



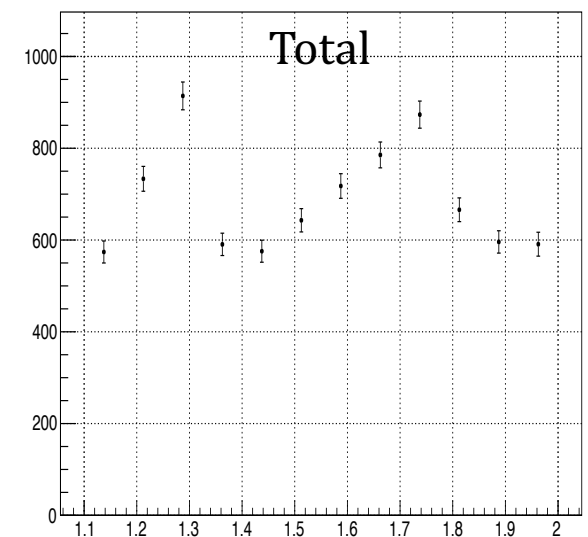
D0mi



D1mi

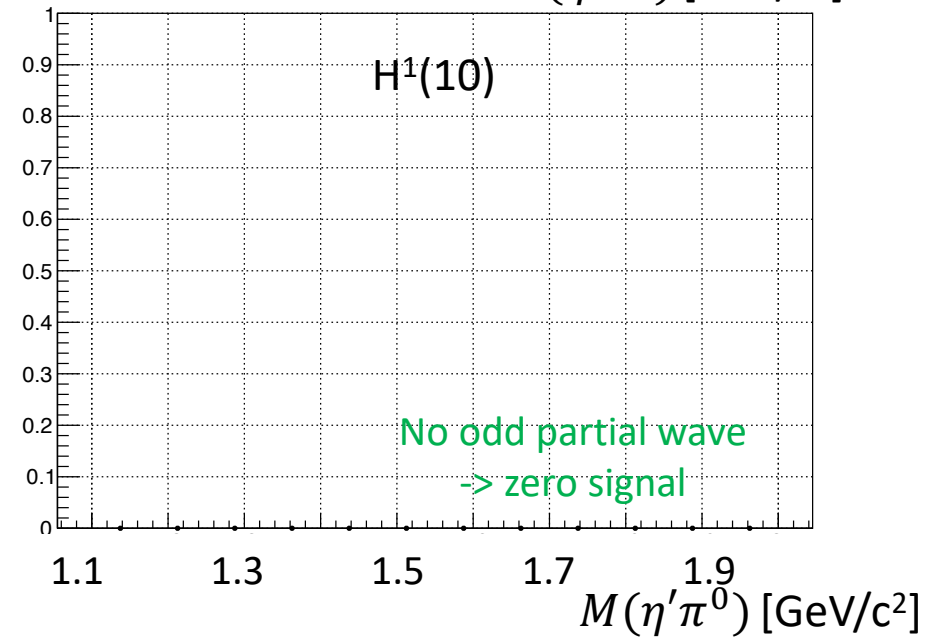
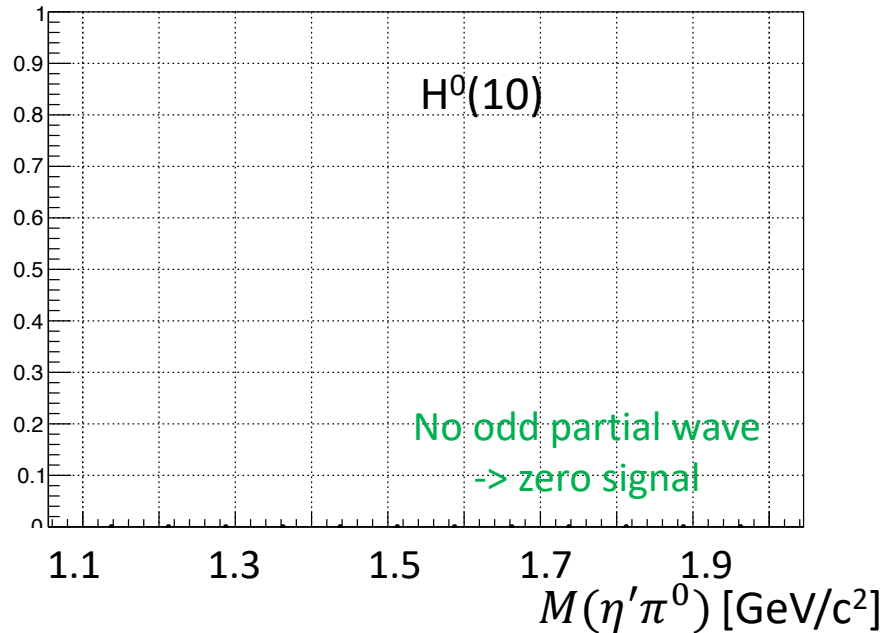
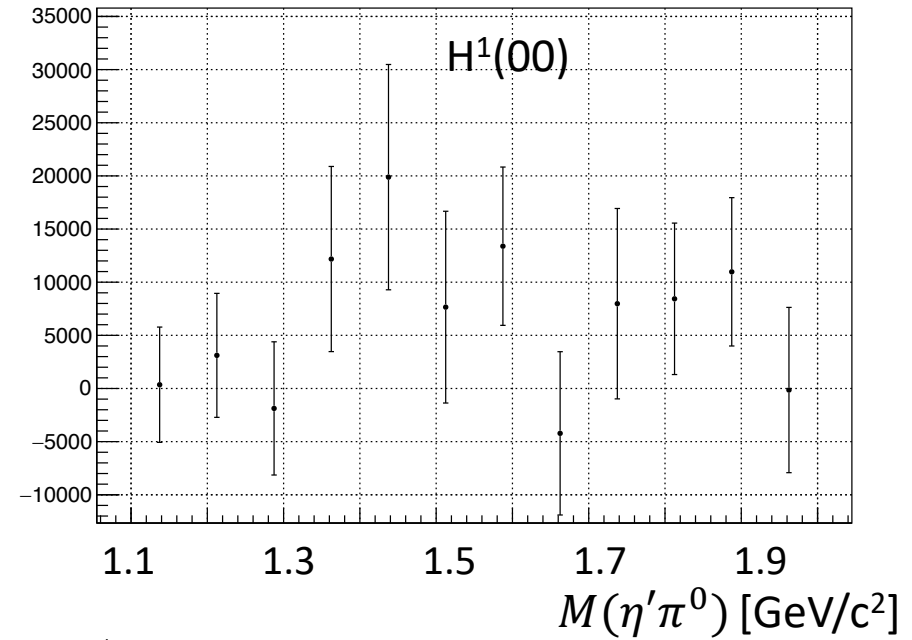
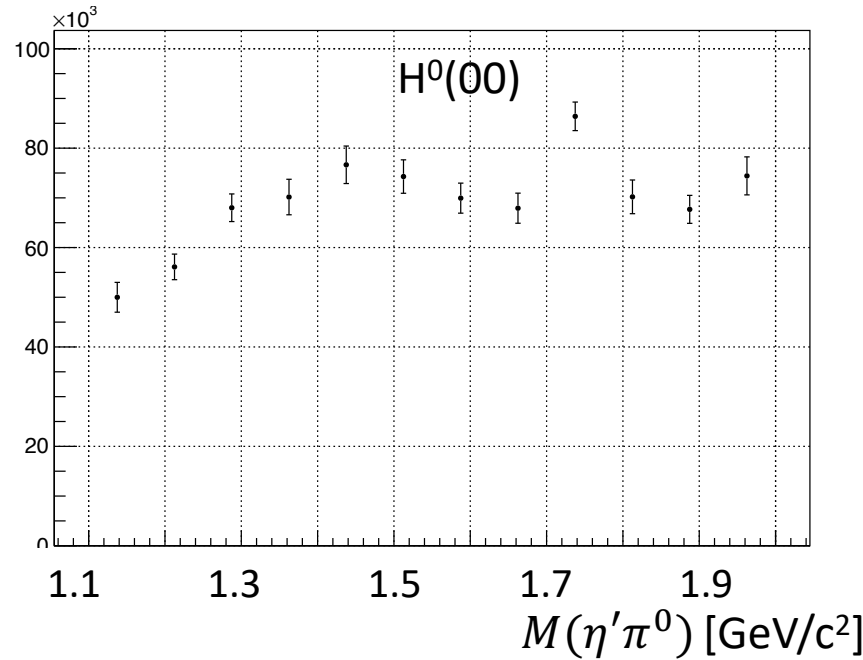


All waves

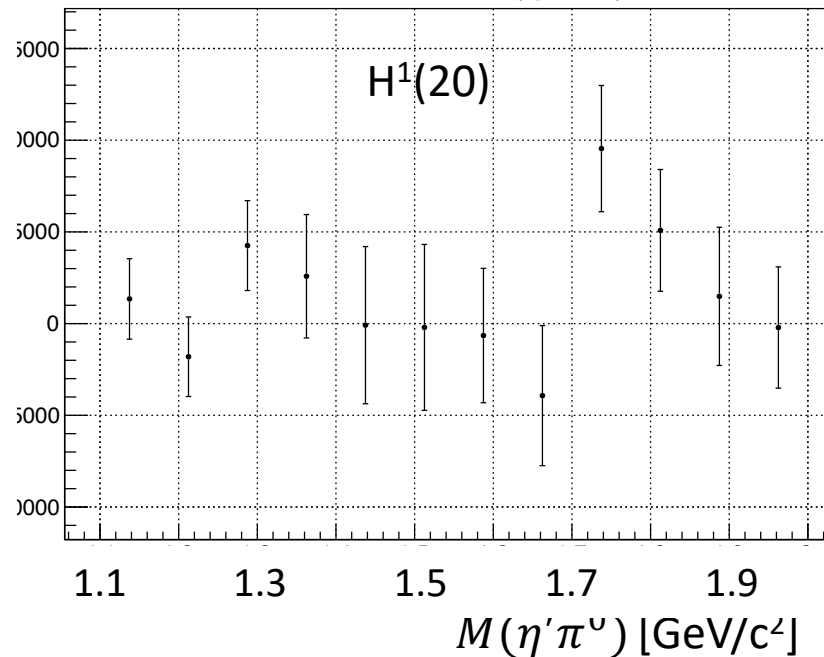
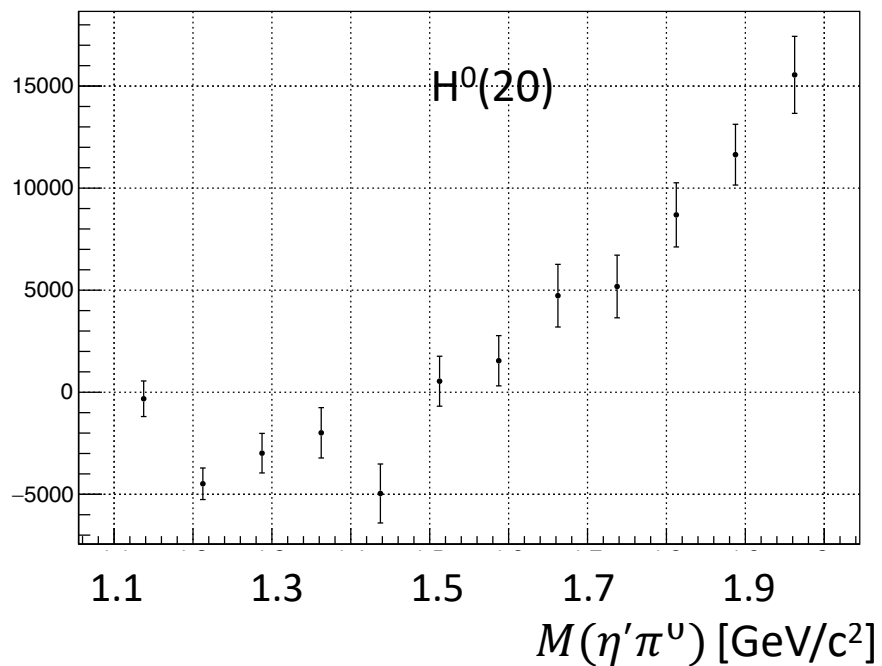
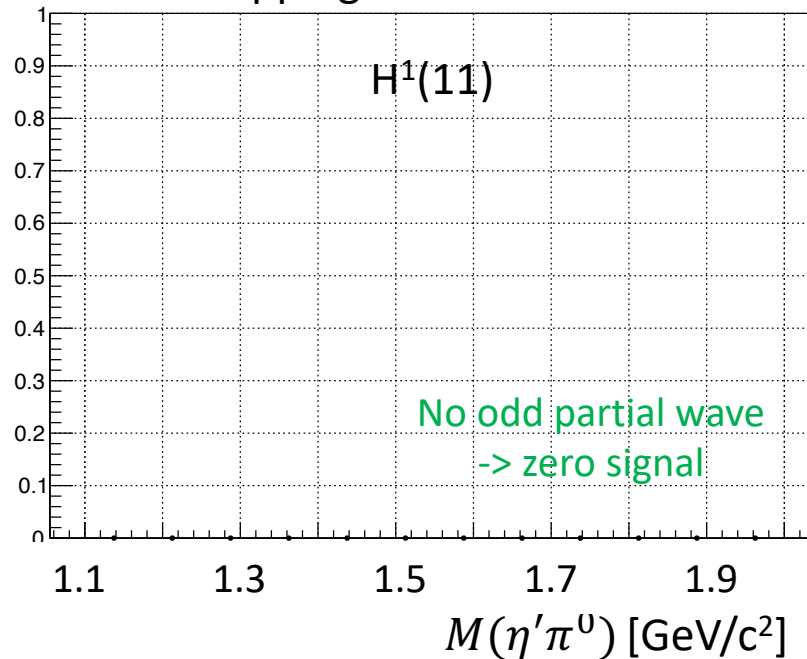
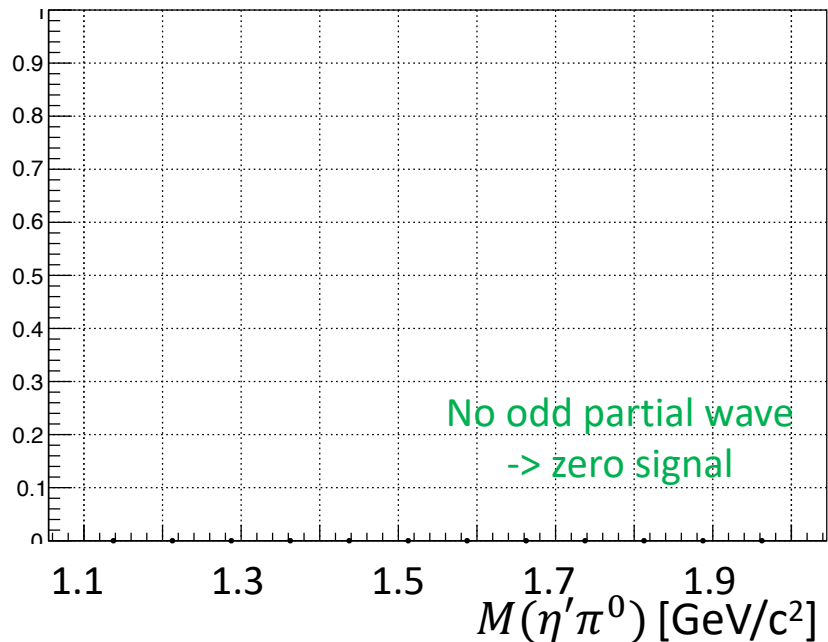


$0.1 < t < 0.7 \text{ (GeV/c)}^2$

Uncertainties from bootstrapping

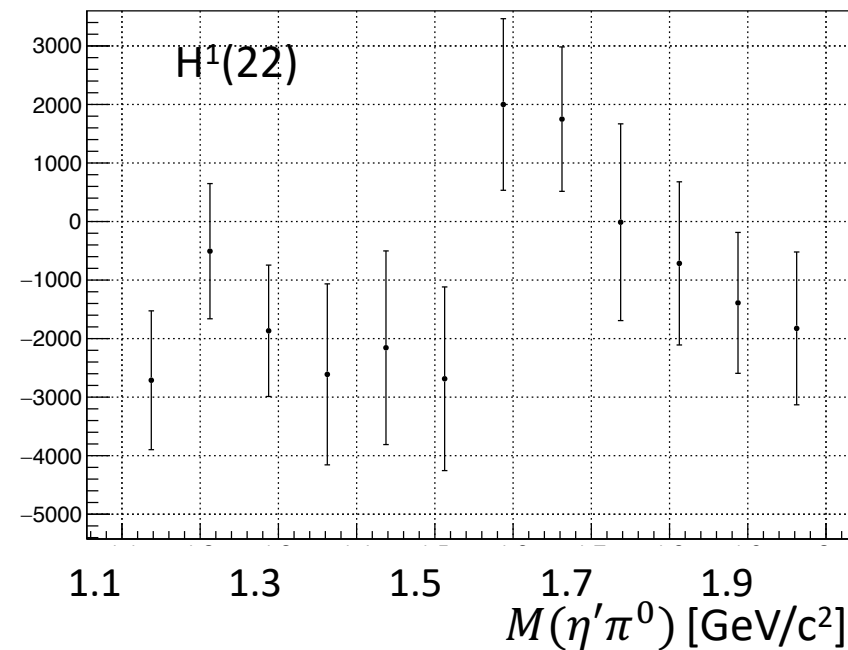
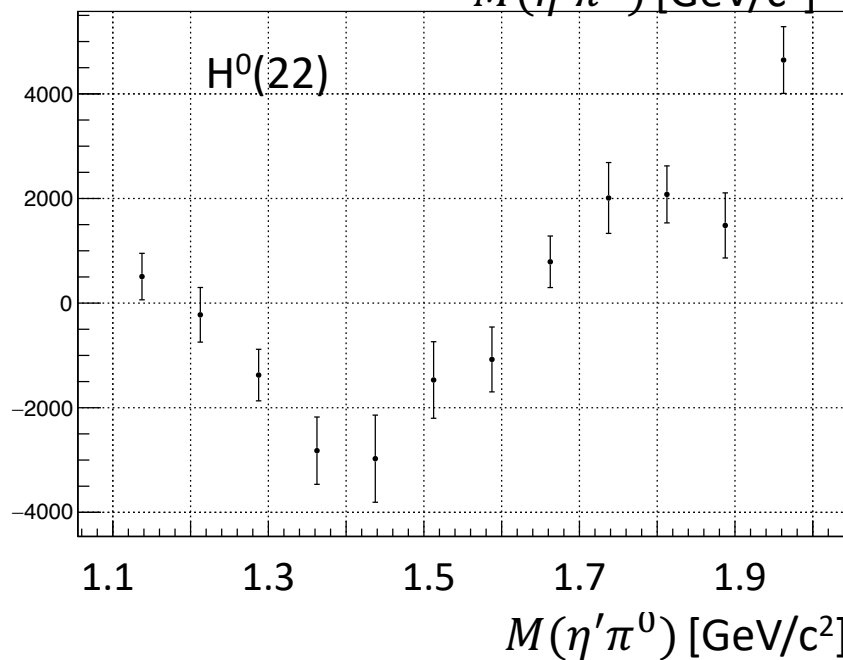
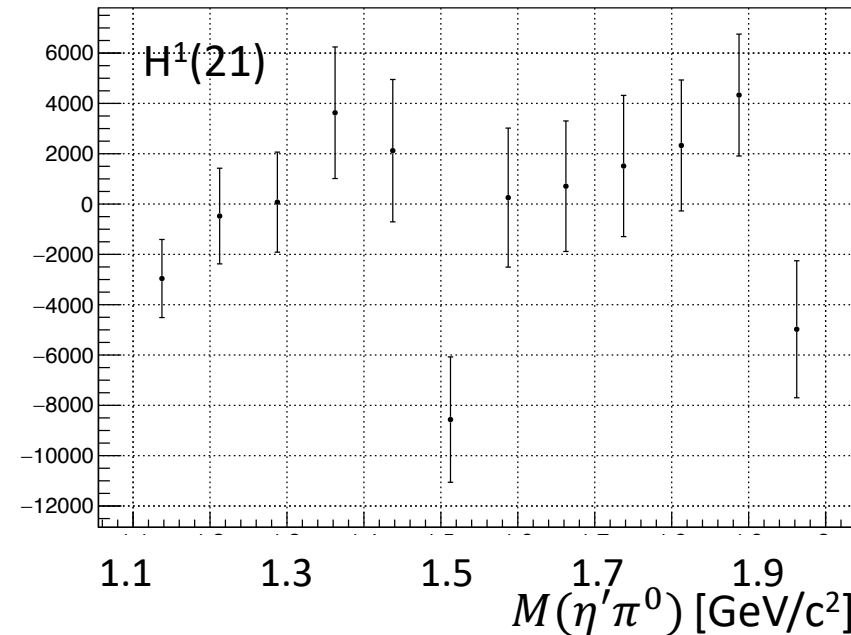
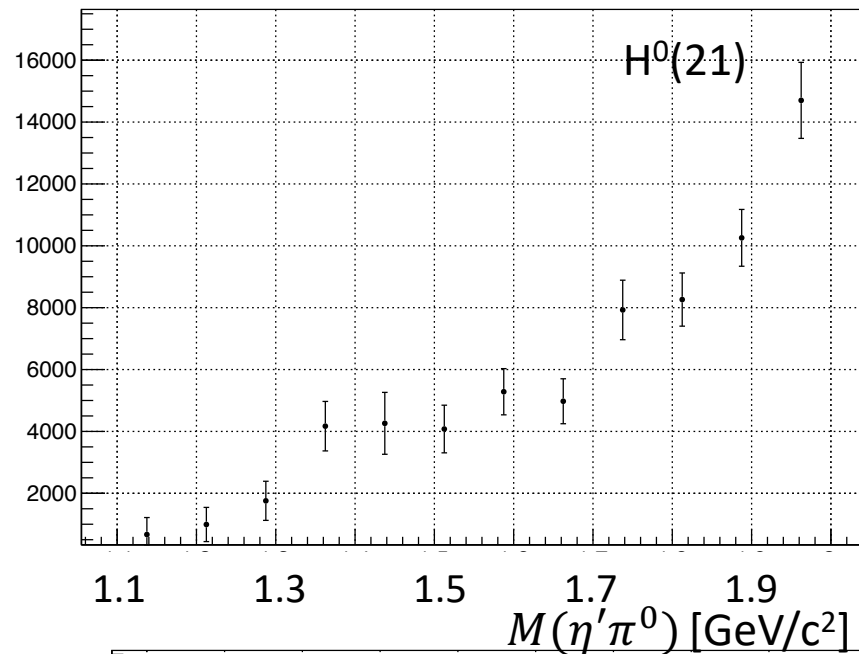


$0.1 < t < 0.7 \text{ (GeV/c)}^2$ Uncertainties from bootstrapping



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