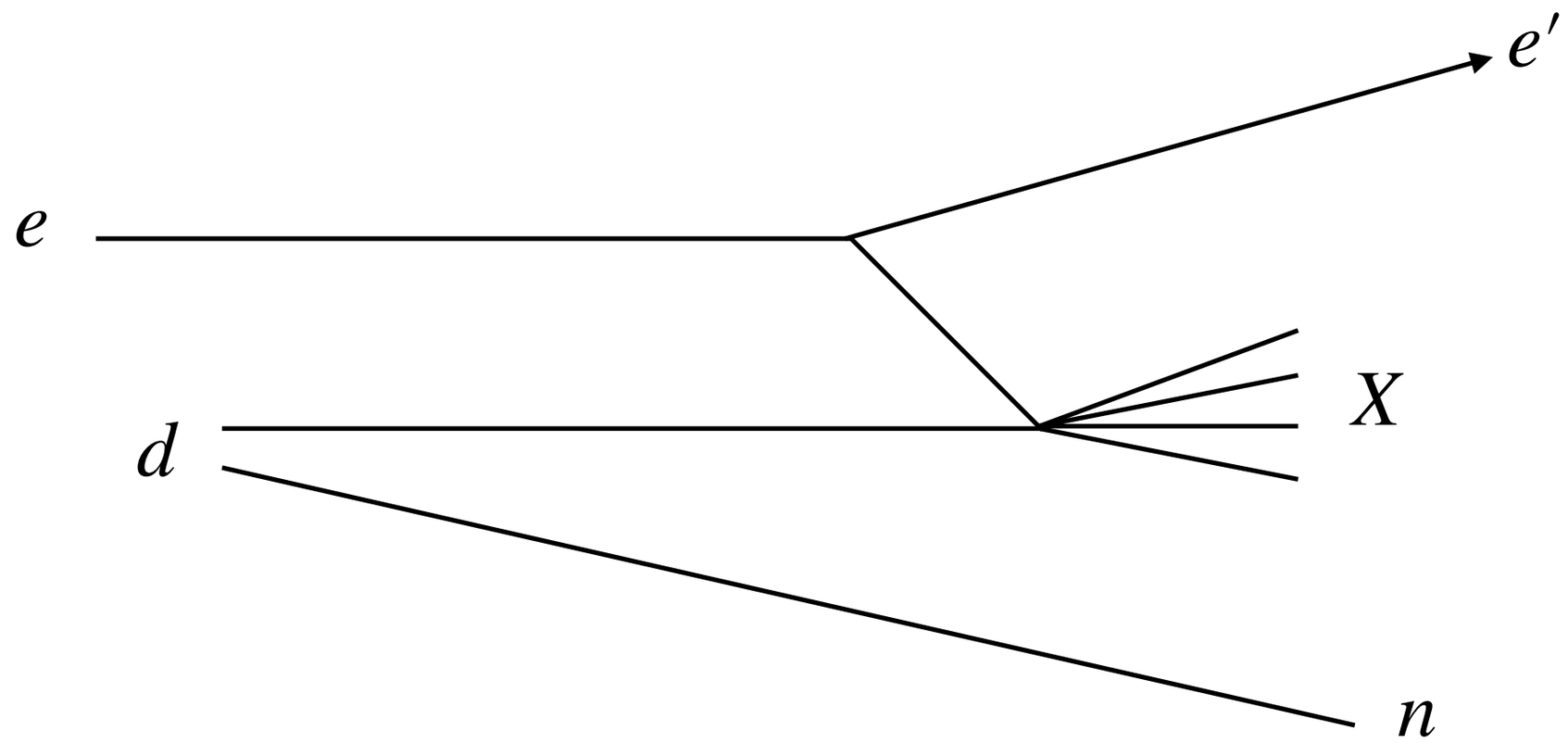
BAND Analysis Plan

Efrain Segarra
Reynier Cruz Torres
Florian Hauenstein

d(e,e'n)X



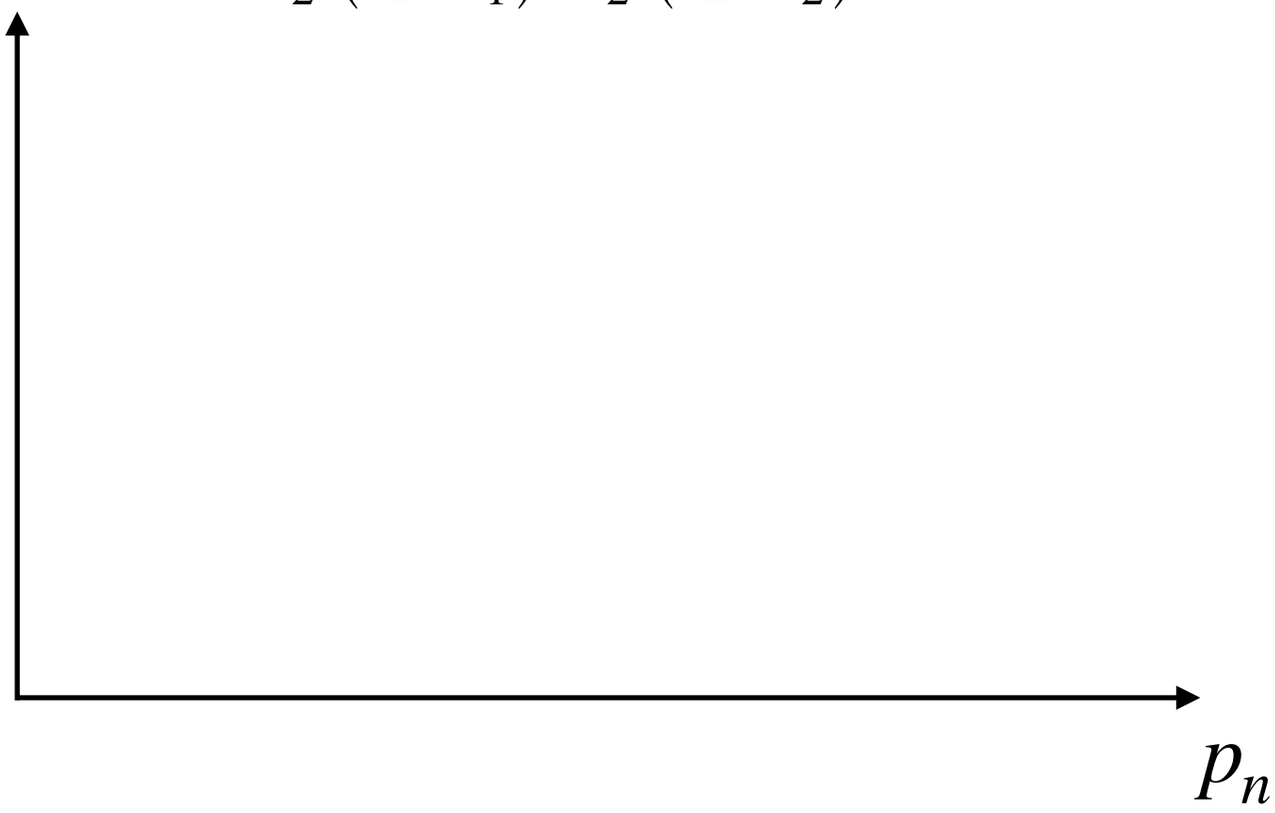
ϕ_e, Q^2, x

$\phi_{nq}, \theta_{nq}, p_n$

σ insensitive to ϕ_e, ϕ_{nq}

What we want

$$\frac{G^{eff}}{G^{p}}\left(p_n\right) = \frac{F_2^{eff}\left(x_1', Q_1^2, p_n\right) / F_2^{eff}\left(x_2', Q_2^2, p_n\right)}{F_2^{p}\left(x_1, Q_1^2\right) / F_2^{p}\left(x_2, Q_2^2\right)}$$



Will need to determine acceptance

$$\frac{F_2^{eff}\left(x_1', Q_1^2, p_n\right)}{F_2^p\left(x_1, Q_1^2\right)} = \frac{\int d(\cos\theta_{nq}) \int dQ^2 \;\; \sigma_d\left(x_1', Q^2, \theta_{nq}, p_n\right)}{\int dQ^2 \;\; \sigma_p\left(x_1, Q^2\right)}$$

Will need to determine acceptance

x	Q^2	$\cos\theta_{nq}$	Acc [%]

σ insensitive to ϕ_e, ϕ_{nq}

So for given (x,Q^2), generate e' vector with random ϕ_e, and given (θ_{nq}) generate n vector with random ϕ_{nq} and get acceptance over all possibilities

Fill with geometrical monte carlo

Can expand table to group in x’

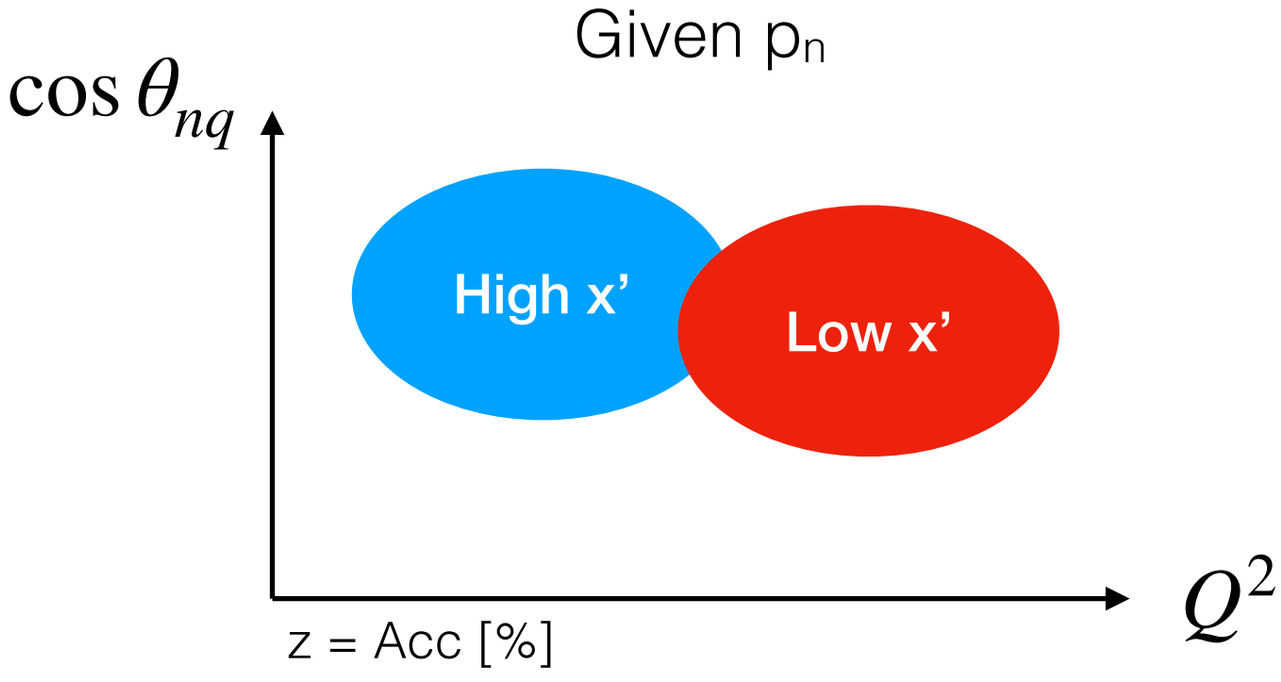
x	Q^2	$\cos\theta_{nq}$	Acc [%]	Counts above background in ToF/m
				| 4 ns/m | 5 ns/m | … | 10 ns/m |

Each column defines an p_n and row with this defines x’

With this we can define fiducial region of Q^2,θ_{nq} for given x'

$$\frac{F_2^{eff}\left(x_1', Q_1^2, p_n\right)}{F_2^p\left(x_1, Q_1^2\right)} = \frac{\int d(\cos\theta_{nq}) \int dQ^2 \quad \sigma_d\left(x_1', Q^2, \theta_{nq}, p_n\right)}{\int dQ^2 \quad \sigma_p\left(x_1, Q^2\right)}$$

x	Q^2	$\cos\theta_{nq}$	Acc [%]	Counts above background in ToF/m
				| 4 ns/m | 5 ns/m | … | 10 ns/m |

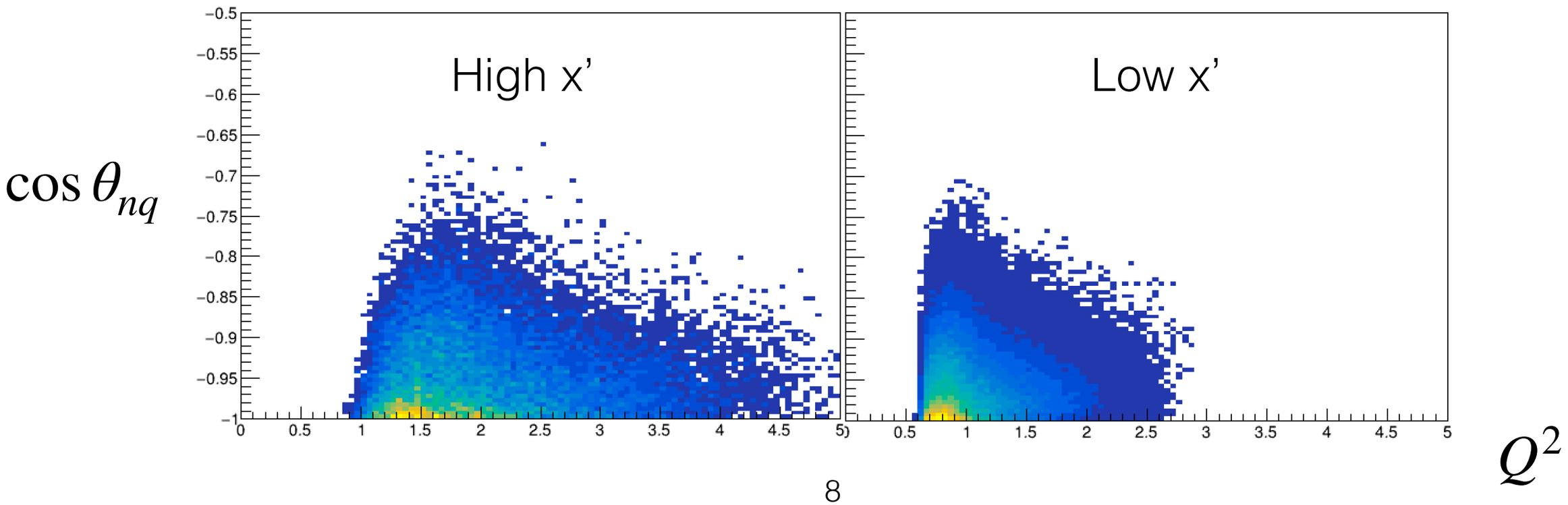


With this we can define fiducial region of Q^2,θ_{nq} for given x'

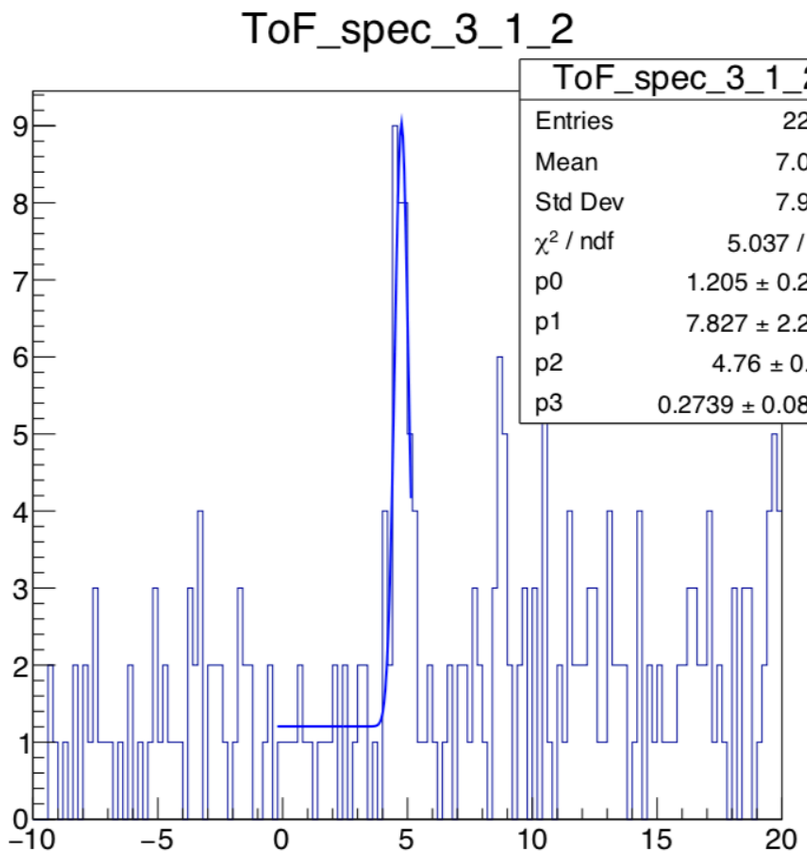
$$\frac{F_2^{eff}\left(x_1', Q_1^2, p_n\right)}{F_2^p\left(x_1, Q_1^2\right)} = \frac{\int d(\cos\theta_{nq}) \int dQ^2 \quad \sigma_d\left(x_1', Q^2, \theta_{nq}, p_n\right)}{\int dQ^2 \quad \sigma_p\left(x_1, Q^2\right)}$$

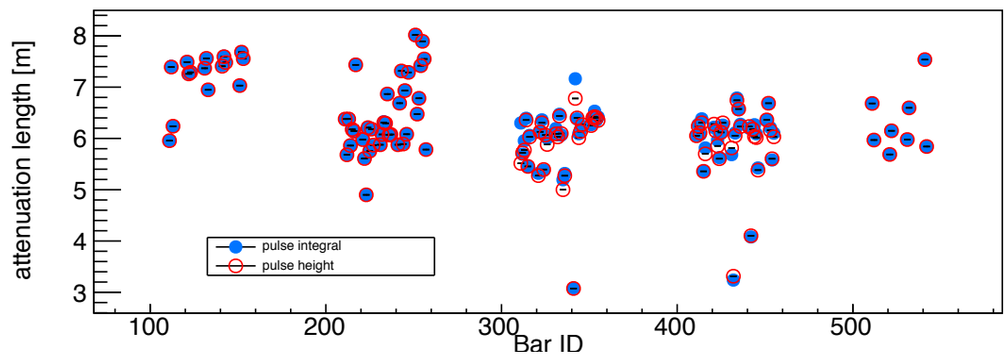
x	Q^2	$\cos\theta_{nq}$	Acc [%]	Counts above background in ToF/m
				| 4 ns/m | 5 ns/m | … | 10 ns/m |

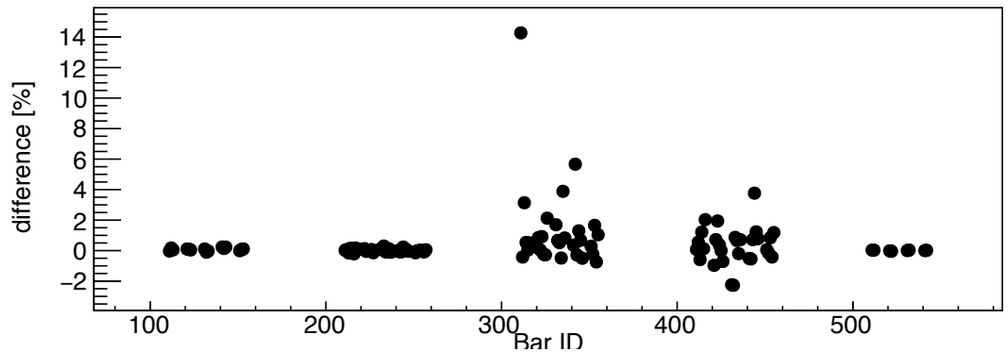
Given p_n 0.4-0.5 GeV/c



Things we did this past week







Still to do

- Exclusive search on full day
- Repeat above ToF alignment with TDC
- Fixing hipo4 reading
- Veto algorithm
- Still difference between TDC/FADC