The bright SRC/EMC future

XEM 2: electric boogaloo

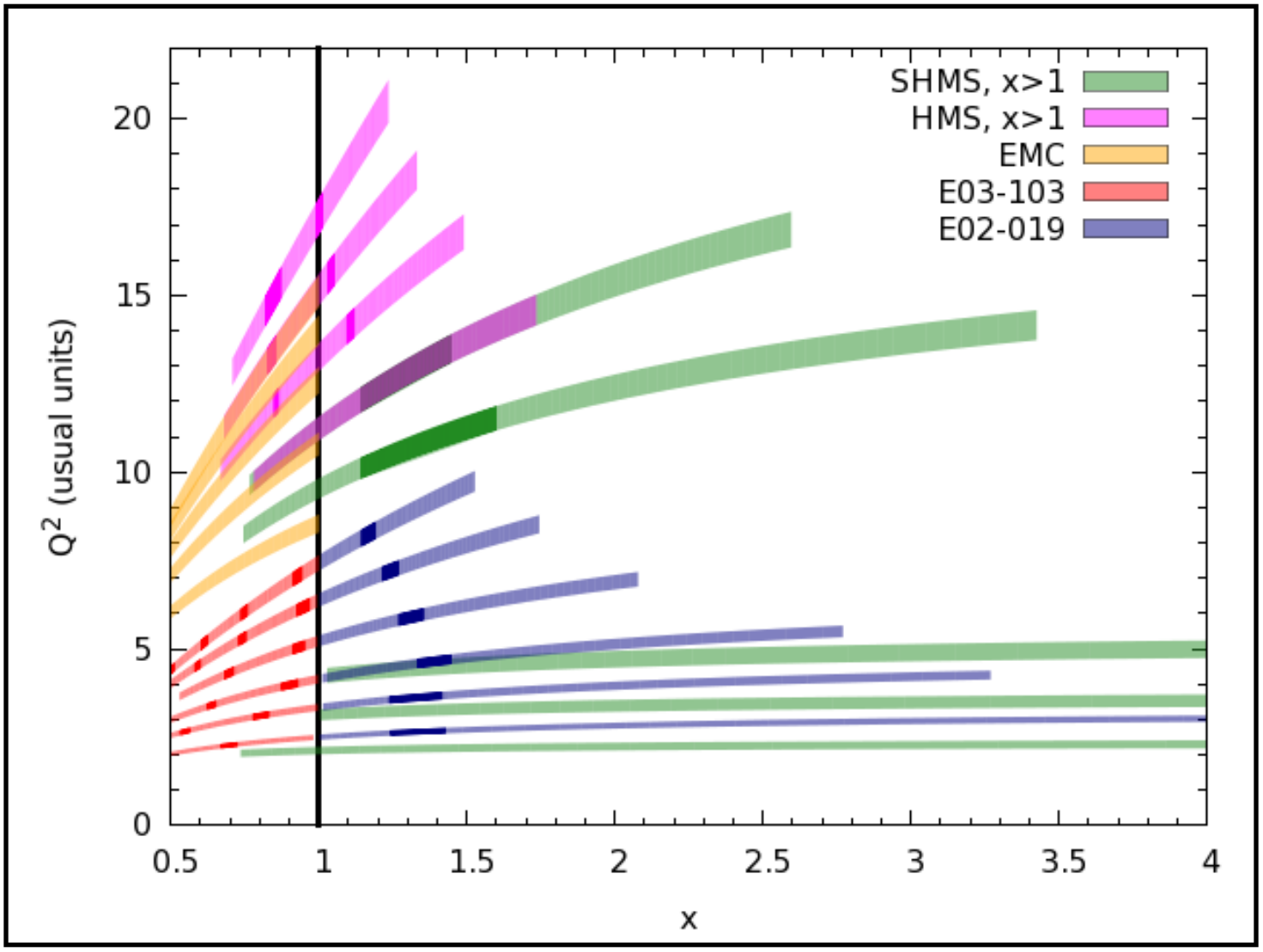
May 30, 2013

Schedule (ish)

2015	2016	2017	2018
Beam to Hall A 3H/3He	Jan/Feb ^{10}B, ^{11}B, ^{12}C	Other stuff	Maybe?

Maybe talk to Steve about running in 2017
Any reason to delay?

Settings might need to be slightly optimized/merged



X>1 angles:

SHMS:

8, 10, 12, 22, 26

HMS

26, 32, 40, 55

EMC angles:

SHMS:

20, 25, 30, 35, 40

2016 Running

EMC: 30 deg

X>1: 17 deg

(0.8<x<2.2)

Time include positron background studies?

Simona's Runplan

SHMS (e^-)

Angle (deg)	E_p (GeV)	H_2 (h)	D_2 (h)	Al(empty) (h)	^{12}C (h)	^{10}B (h)	^{11}B (h)
17	7.5 6.1 5.5 5 4.5 4	0.5 0.1 0.1 0.1 0.1 0.1	0.5 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1	0.5	0.5	0.5
20	5.4 4.4 3.5 2.9	0.4 0.1 0.1 0.1	0.4 0.1 0.1 0.1	0.2 0.1 0.1 0.1	0.1 0.1 0.1 0.1		
25	4.4 3.5 2.8	1.6 0.4 0.2	1 0.4 0.2	0.5 0.2 0.2	1 0.25 0.2		
35	2.95 2.4 1.9 1.55	13.3 2.5 1 0.6	7 1.5 0.5 0.6	2 0.5 0.3 0.3	12 2.5 1 1	To be taken at the end of the e^- running	
40	2.4 1.9	22 5	11 3	3 1	11 2		
30	3.6 3.2 2.7 2.4 2	5.4 2 0.7 0.5 0.3	3 1 0.7 0.5 0.3	1 0.5 0.5 0.2 0.2	2 0.5 0.5 0.5 0.5	2 0.5 0.5 0.5 0.5	2 0.5 0.5 0.5 0.5
		58 h	33 h	12 h	36 h	4.5 h	4.5 h

2015: ~25 PAC days – Commissioning "Experiment"

9 days of E12-06-107 search for color transparency

A(e,e'p) only – "easy" coincidence measurement

E12-10-002 $F_2^{p,d}$ structure functions at large x

Momentum scans help understand acceptance

2 days E12-10-108 EMC Effect

Integrate light nuclei with F_2 run,

Point target helps acceptance studies.

Sneaking in

3 days of E12-10-003 d(e,e'p)

If time available

Push to lower cross sections

2016:

E12-09-017 P_t dependence of basic SIDIS cross sections

Push particle ID capabilities of SHMS

E12-09-002 Precise $\pi^+\pi^-$ ratios in SIDIS – Charge Symmetry

Detector efficiencies

E12-09-011 L/T separated p(e,e'K^+) factorization test

Easiest L/T separation

2017:

E12-06-121 g_2^n measurements at fixed Q^2

First polarized ^{3}He target experiment in Hall C

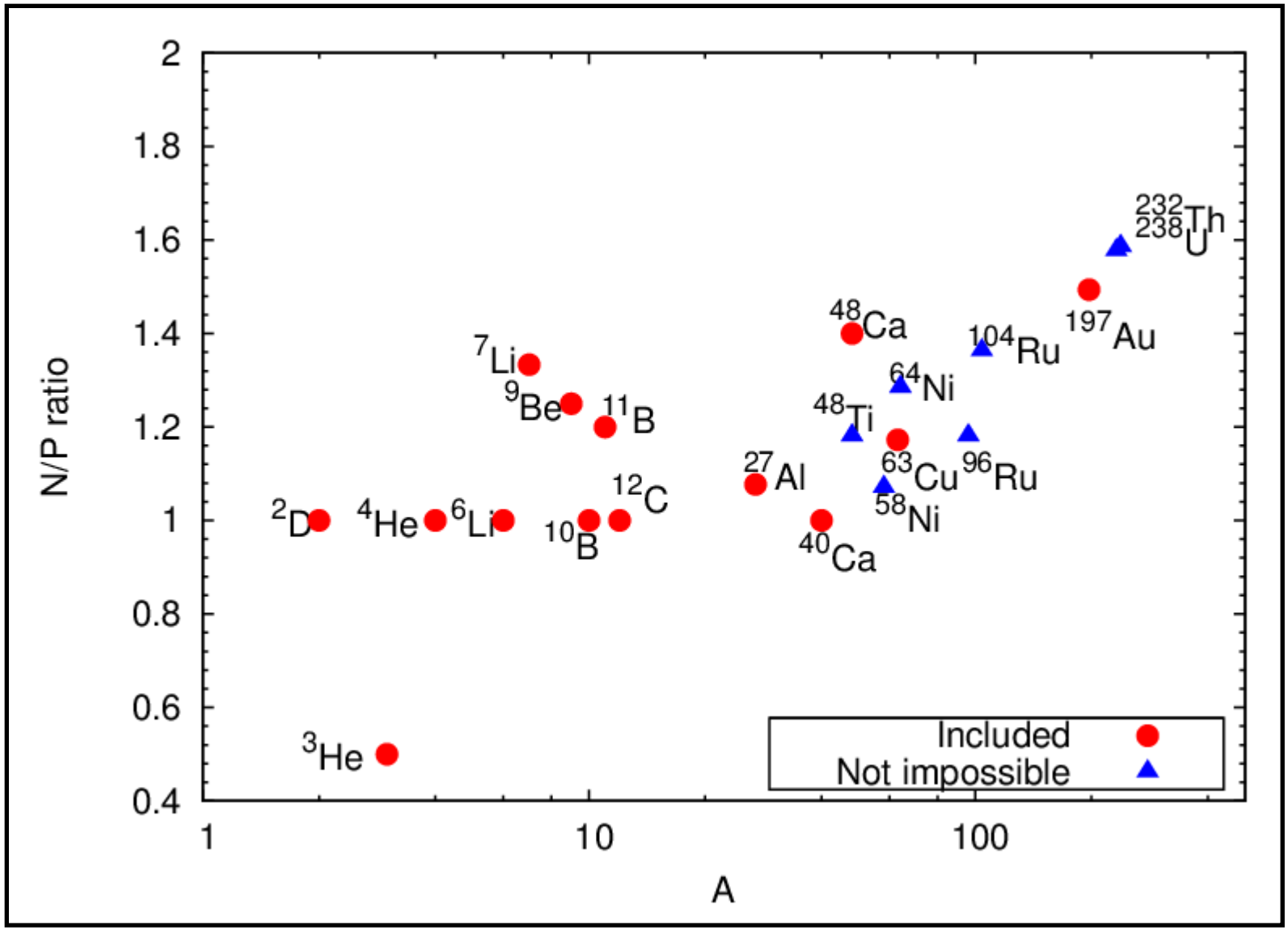
A_1^n, $F\pi$, GeN?

Targets to consider (assuming 1x1 mm^2 raster)

Target	A	Z	Why?	Max current
Titanium	48	22	TO compare to 48Ca	40uA
Nickel	58	28	Buddies	80uA
Nickel	64	28	for Calcium	80uA
Ruthenium	96	44	Same	80uA
Ruthenium	104	44	Same	80uA
Thorium	232	90	Distorted nucleus – possible spatial dependence of SRCs	80uA
Uranium	238	92	Best n/p	10uA (very conservative)

Target ladder: 3 loops + 4 “normal” solid targets
Calcium goes into loop 3
^{6}Li, ^{7}Li, ^{12}C, ^{63}Cu, ^{197}Au → just over one ladder (lots of space!)

Sensitivity to NP pairs as N/P ratio



Manpower and stuff to do

- Students
  - → Can work on new replay engine ahead of time
  1. Kayla Craycraft – UT (x>1 in 2016, maybe EMC 2016?)

- Targets
  - → Make ORNL redo calcium targets?
  - → Demand ^{40}Ca foil and a less crappy ^{48}Ca foil?
  - → Thickness measurements (Nadia will investigate)
  - → Pure boron?

- Is there anything expensive that needs money? (I don't think so)