the argument in a nutshell

- aim of Run-13 is to complete the W physics program
  - milestones: NSAC HP8 (2013) and RIKEN W (2014)
  - PAC endorsed running for all of Run-13 if necessary
- needs to be a definitive measurement
  - projection: we could get to 200/pb + 50/pb (83% of goal)
  - 5 week run not effective, would need another long run of 510 GeV p+p
- hard to see when one would schedule a long 510 GeV p+p run in official plan

PAC Recommendations

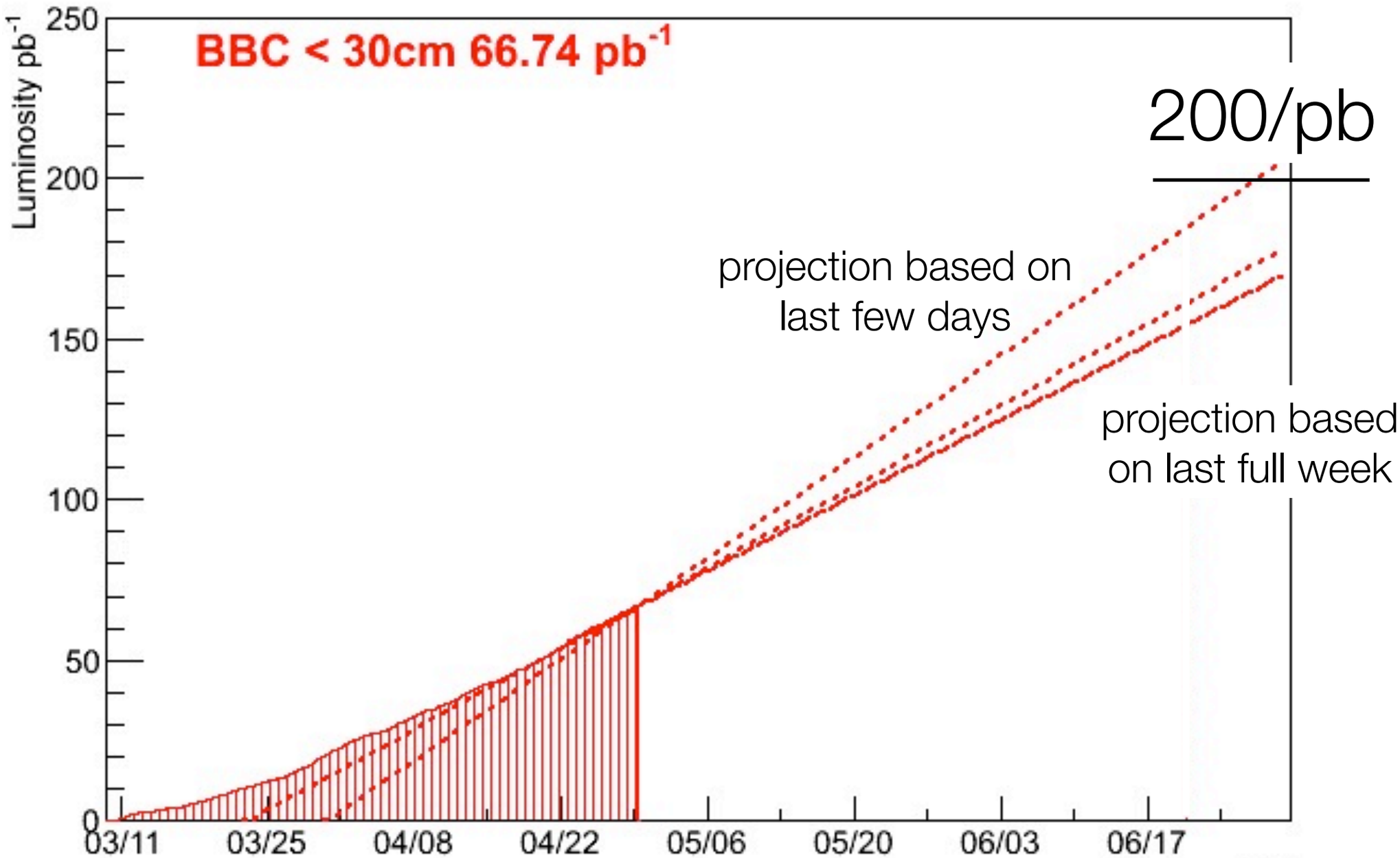
For Run 13 the PAC recommends the following (*in order of priority*):

1. Running with polarized proton collisions at 500 GeV to provide an integrated luminosity of 750 pb^{-1} at an average polarization of 55%.
2. Depending on the amount of running time remaining after priority #1
    a. If less than 3 weeks remain, a week of 200 GeV Au+Au collisions.
    b. If at least 3 weeks of running time remain, 3 weeks of 15 GeV Au+Au collisions.
3. 8 days of 62 GeV p+p collisions.
4. At the discretion of the ALD, 4 days of low-luminosity running to accomplish the pp2pp goals.

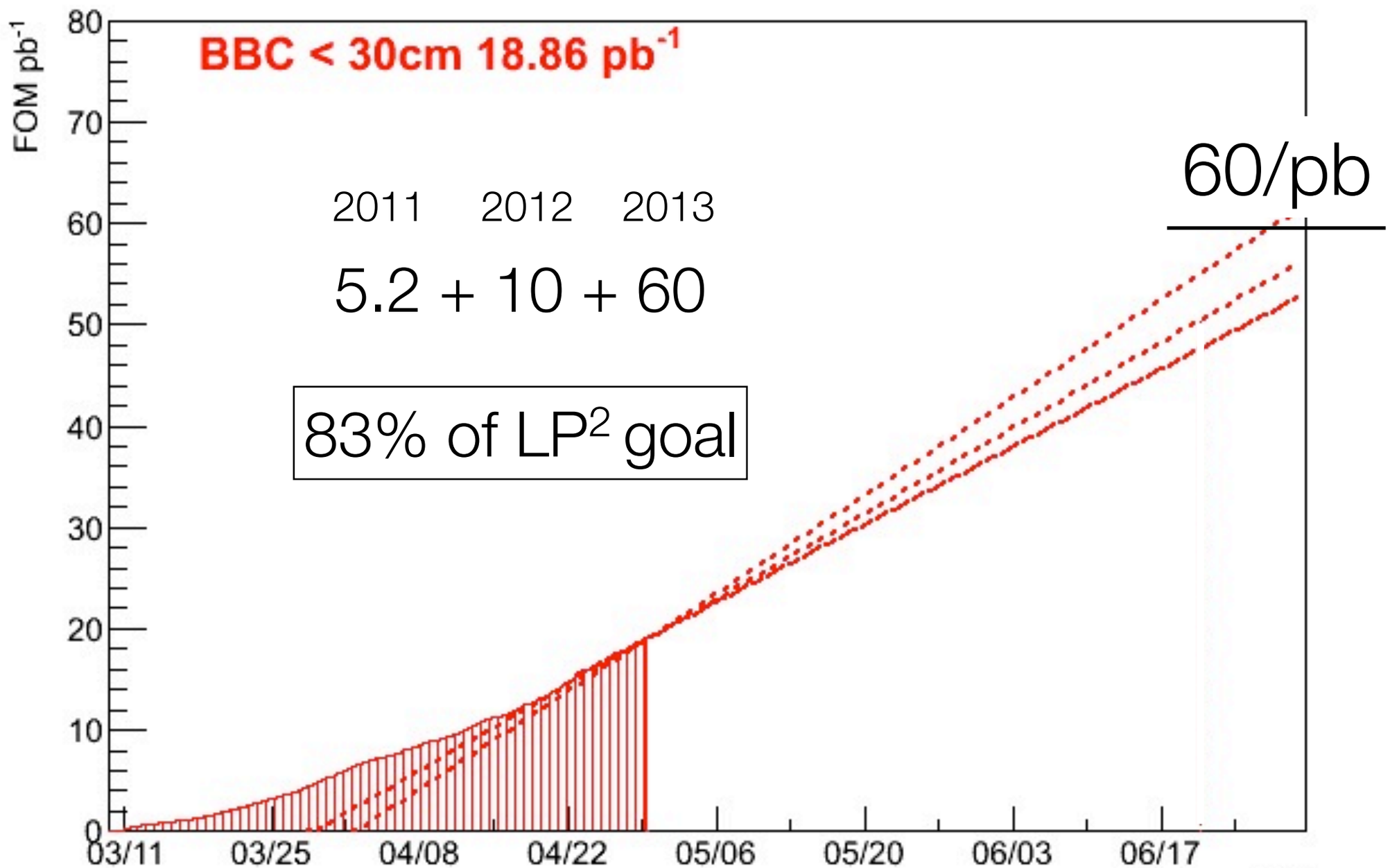
PAC Recommendations

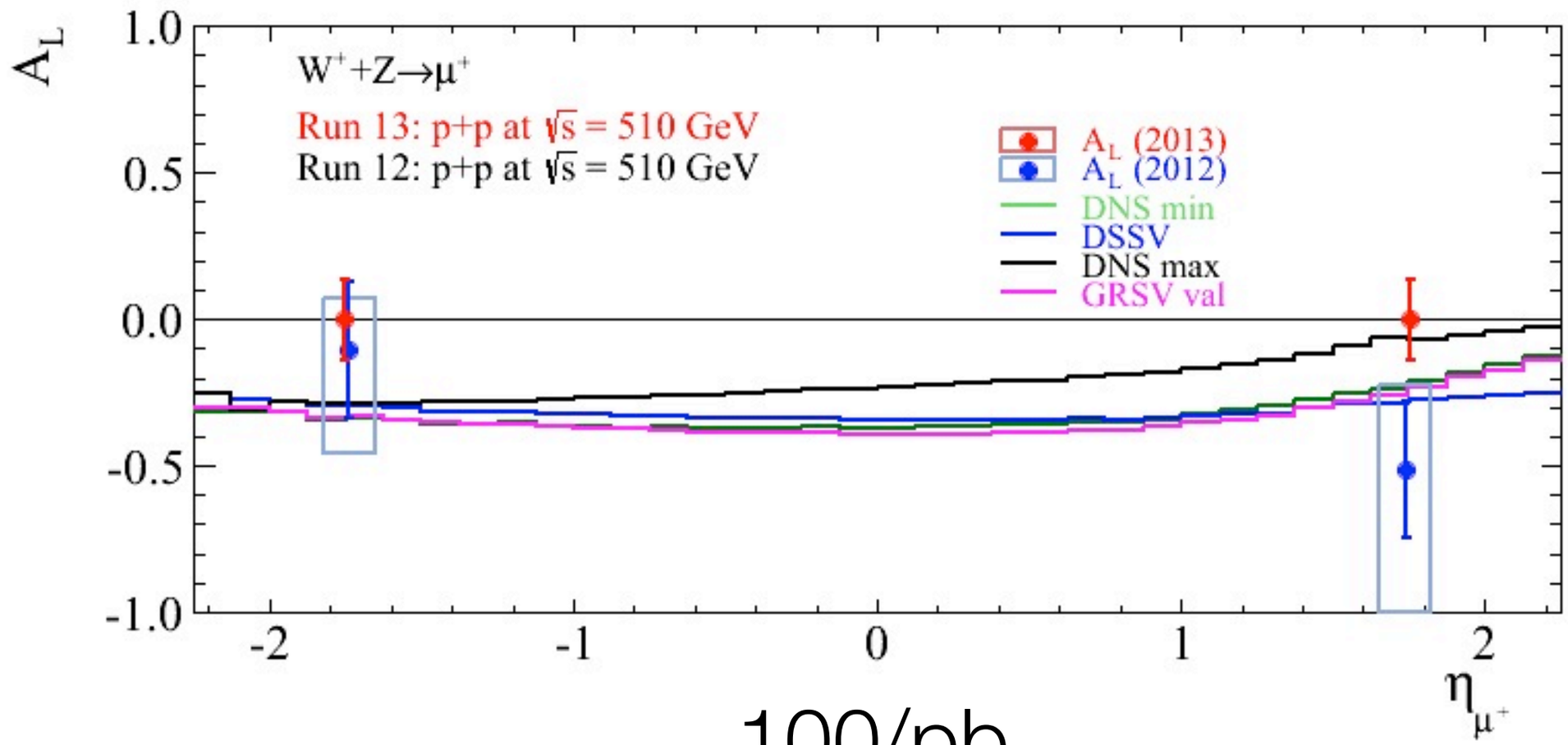
The PAC's highest recommendation for Run 13 is longitudinally polarized p+p running at $\sqrt{s}$ = 500 GeV, in order to reach (or nearly reach) 750 pb^{-1} of delivered luminosity at high polarization of about 55%, commensurate with both collaborations' requests. To reach this goal may require running in this mode for the entire Run 13. The prime scientific focus is clearly on W physics.

integrated L

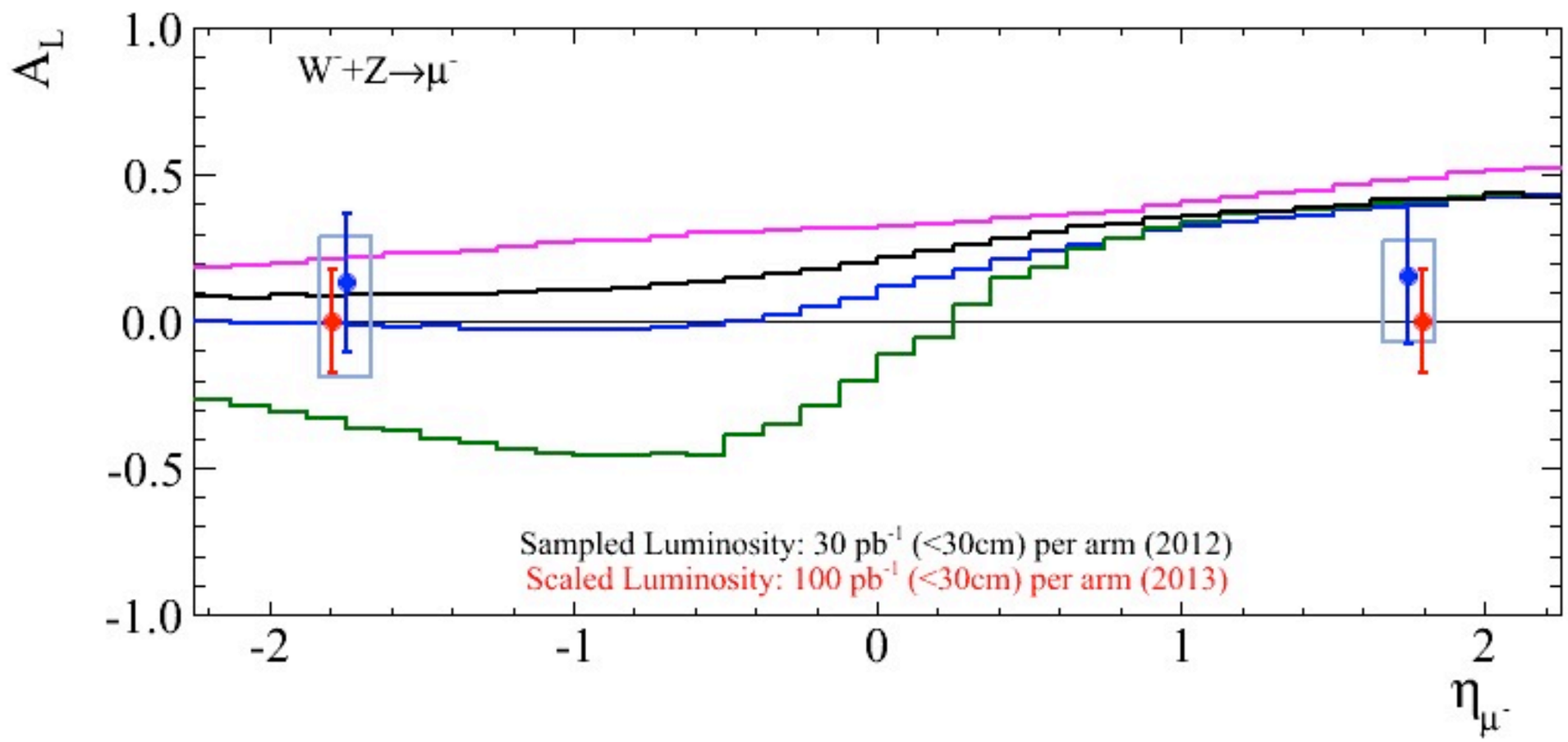


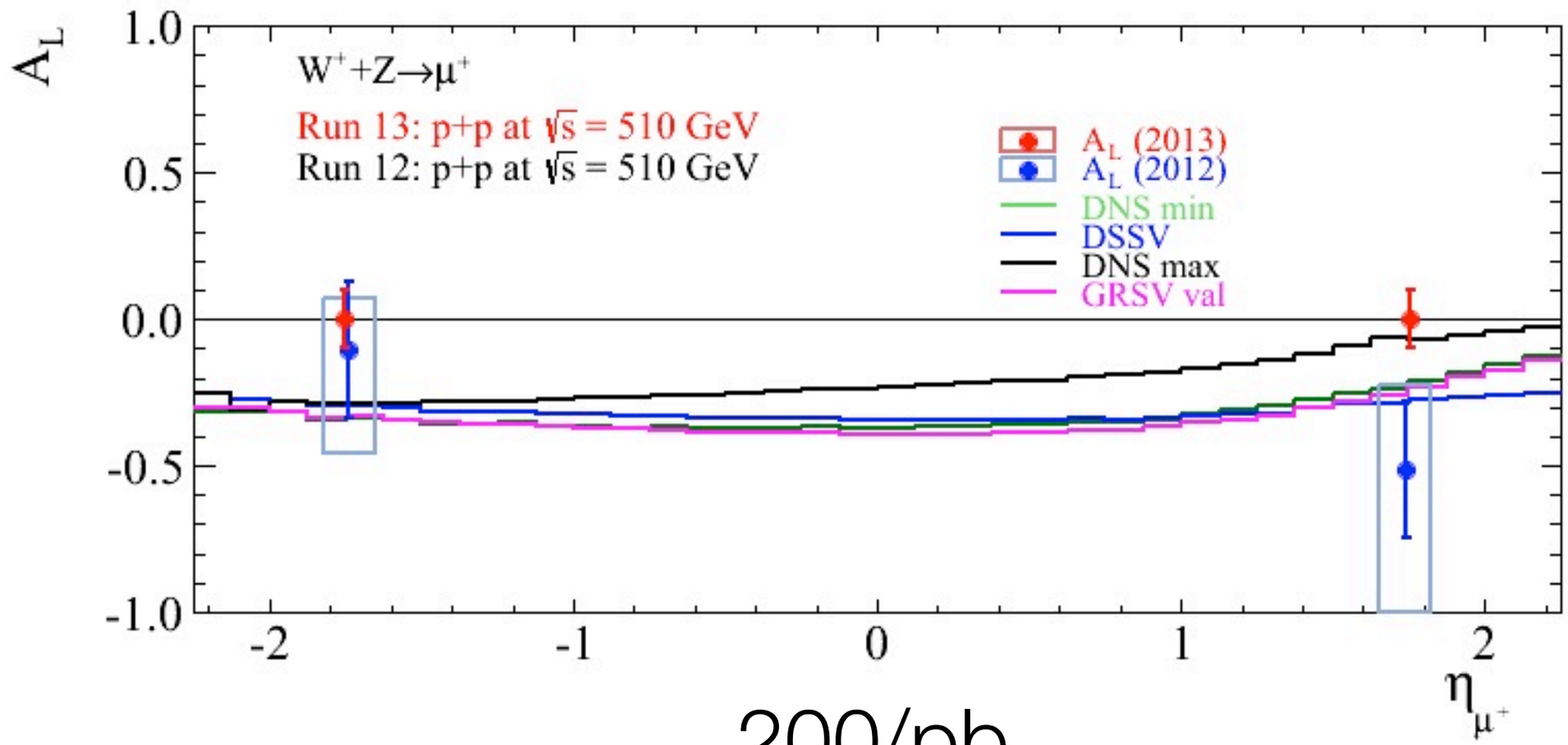
integrated LP^2



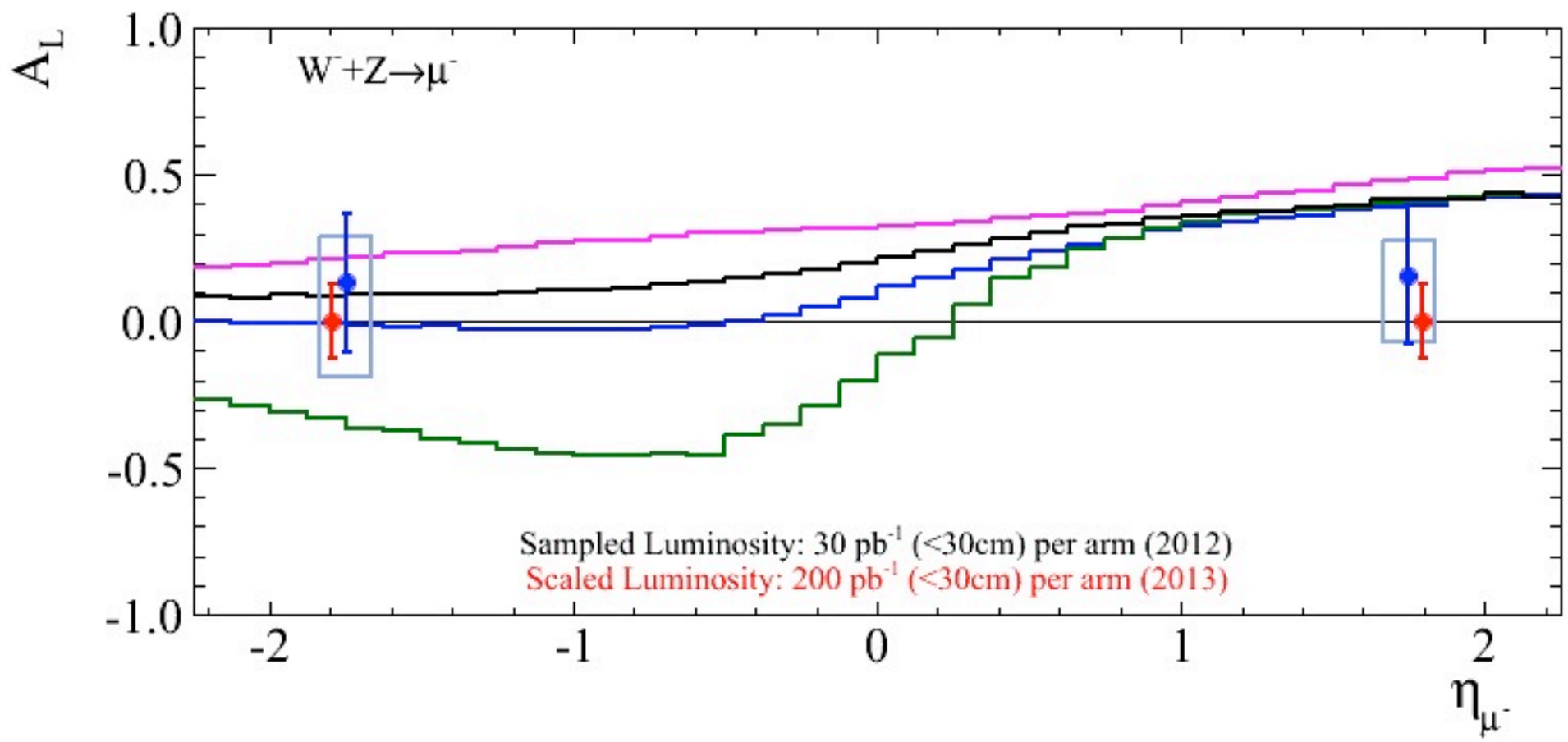

A_L
$W^+ + Z \rightarrow \mu^+$
Run 13: p+p at $\sqrt{s}$ = 510 GeV
Run 12: p+p at $\sqrt{s}$ = 510 GeV
A_L (2013)
A_L (2012)
DNS min
DSSV
DNS max
GRSV val
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^+}

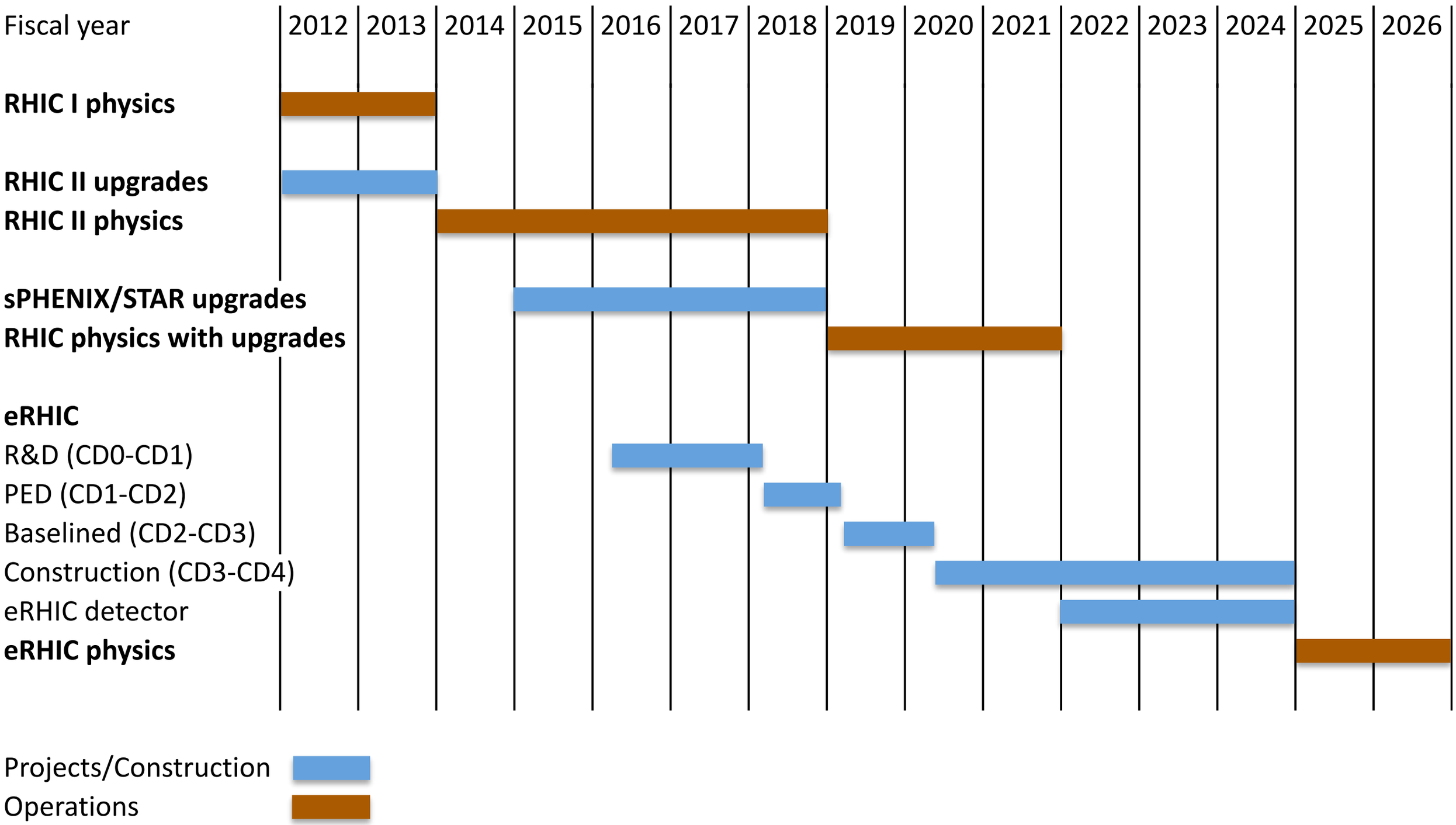
100/pb


A_L
$W^- + Z \rightarrow \mu^-$
Sampled Luminosity: 30 pb^{-1} (<30cm) per arm (2012)
Scaled Luminosity: 100 pb^{-1} (<30cm) per arm (2013)
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^-}

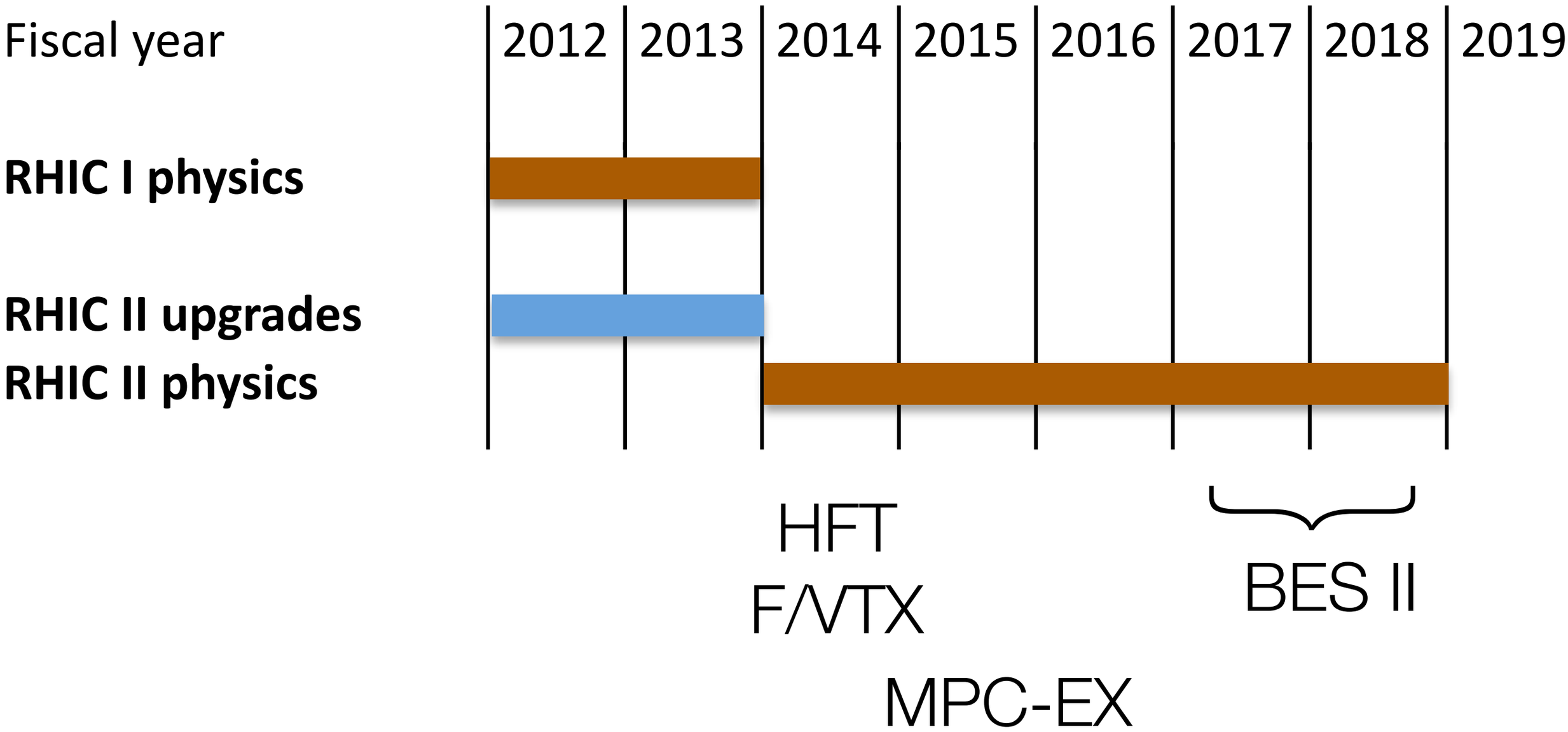

A_L
$W^+ + Z \rightarrow \mu^+$
Run 13: p+p at $\sqrt{s}$ = 510 GeV
Run 12: p+p at $\sqrt{s}$ = 510 GeV
A_L (2013)
A_L (2012)
DNS min
DSSV
DNS max
GRSV val
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^+}

200/pb


A_L
$W^- + Z \rightarrow \mu^-$
1.0
0.5
0.0
-0.5
-1.0
Sampled Luminosity: 30 pb^{-1} (<30cm) per arm (2012)
Scaled Luminosity: 200 pb^{-1} (<30cm) per arm (2013)
-2
-1
0
1
2
η_{μ^-}



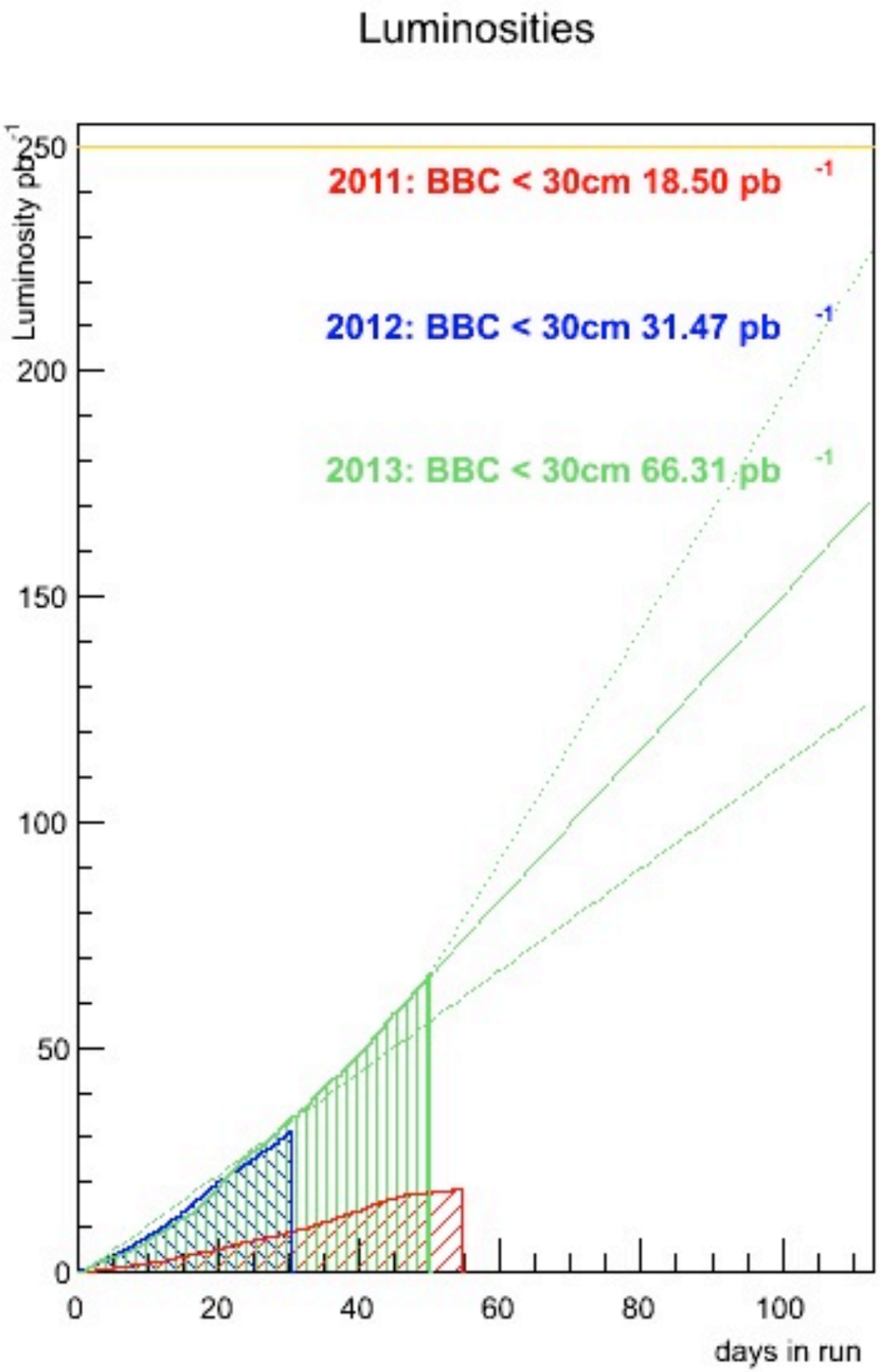
official BNL plan, shown at NSAC facilities review

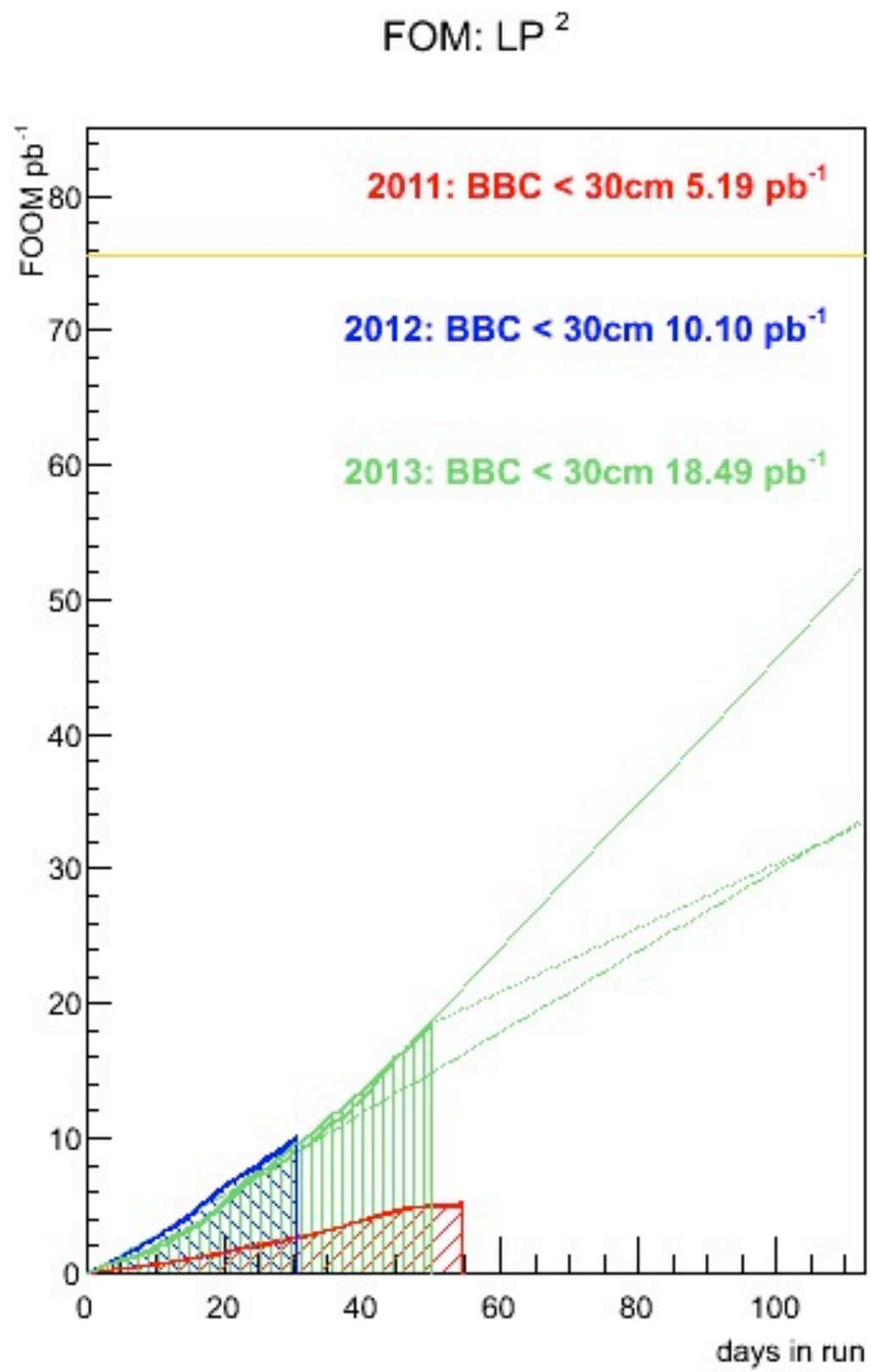


⇒ 200 GeV Au+Au; 200 GeV p+p; p+A; low energy A+A

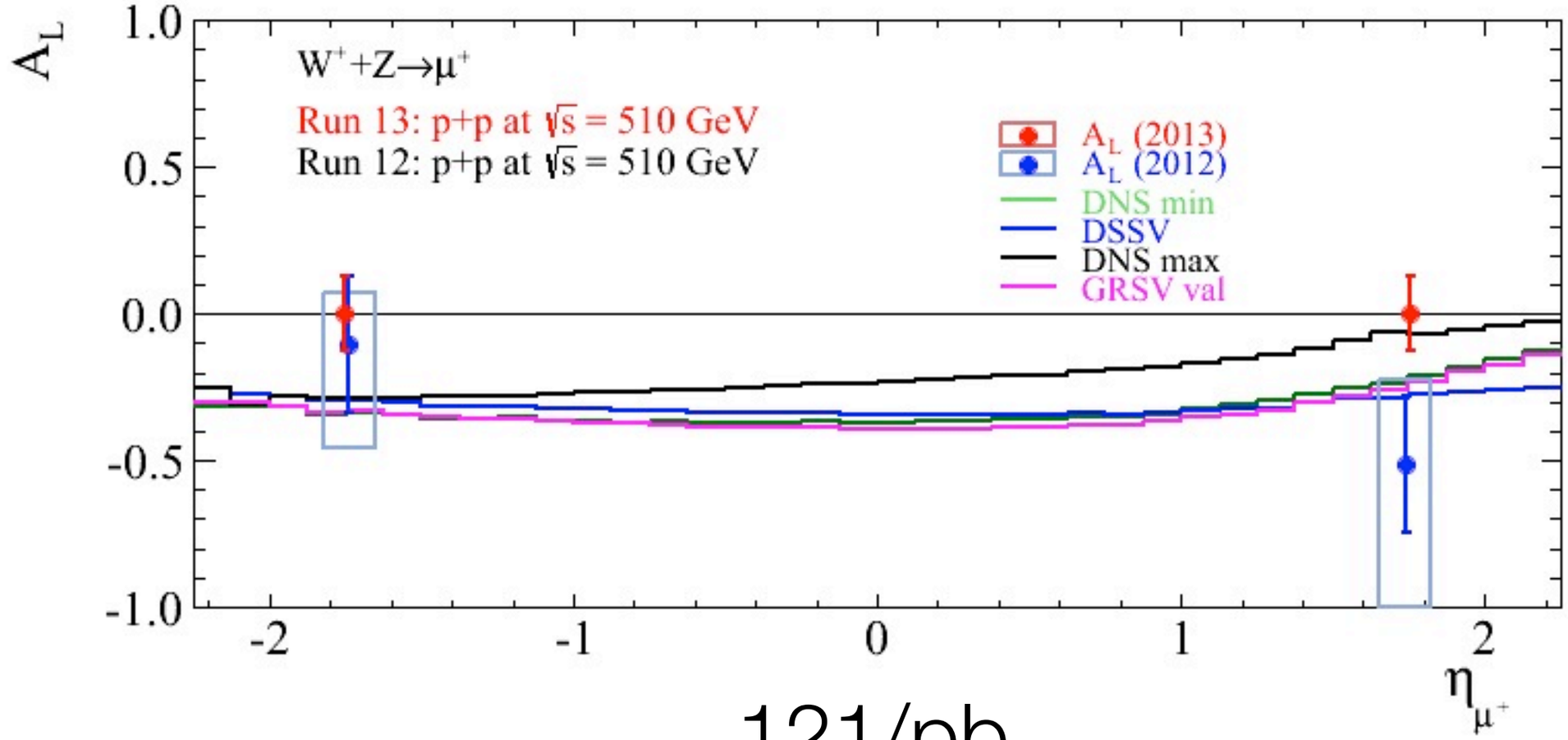
making Run-13 a definitive W measurement

- possible to accumulate 200/pb in Run-13
- requires continued recent excellent accelerator performance
- requires all additional running time we realistically think we could get
- requires PHENIX to continue to improve operations and triggering efficiency
- may require rethinking APEX schedule for remainder of Run-13
- take advantage of big investment in improving L and P
- think like an economist: given amount of LP^2 now is much cheaper than later





short runs are not an effective way to accumulate LP^2


A_L
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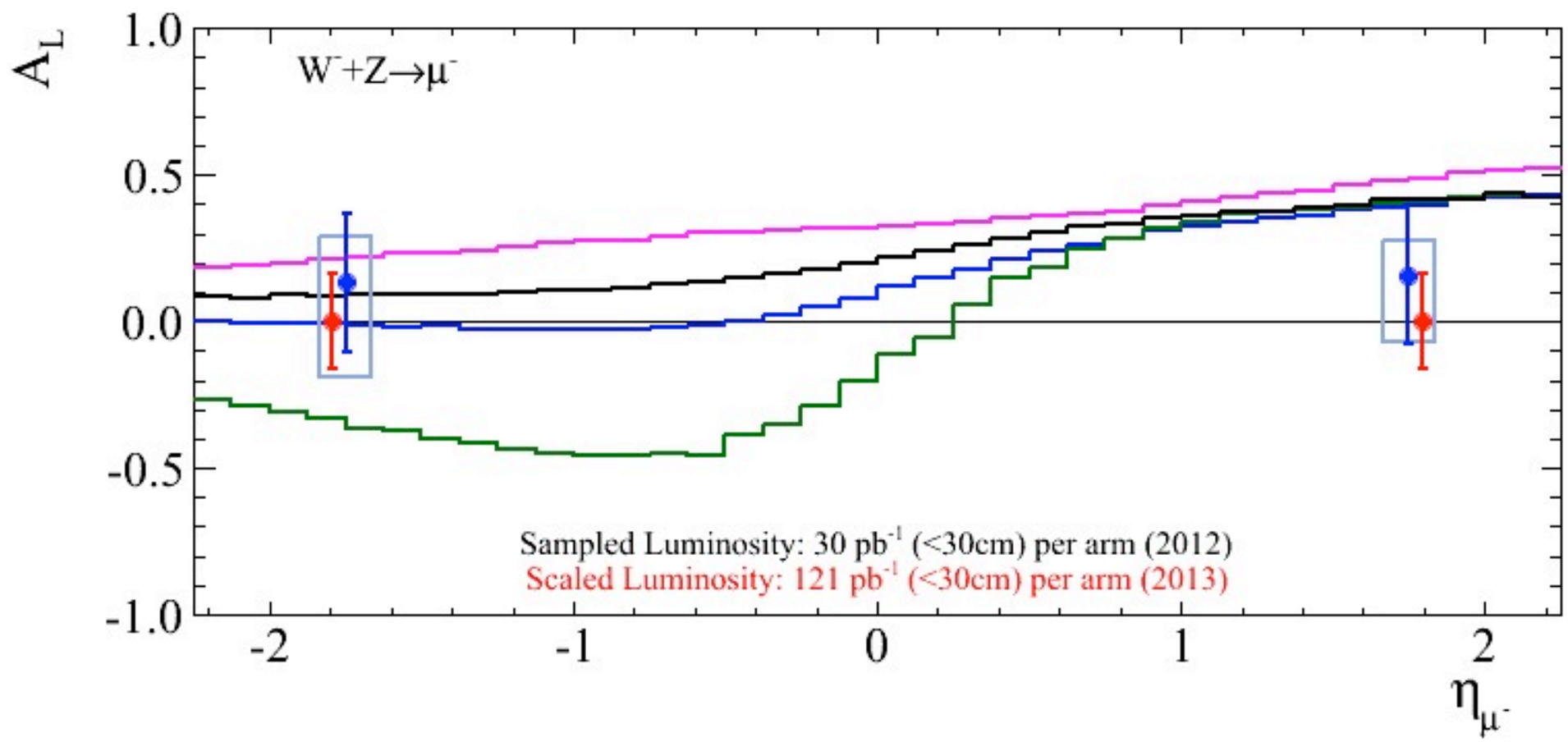
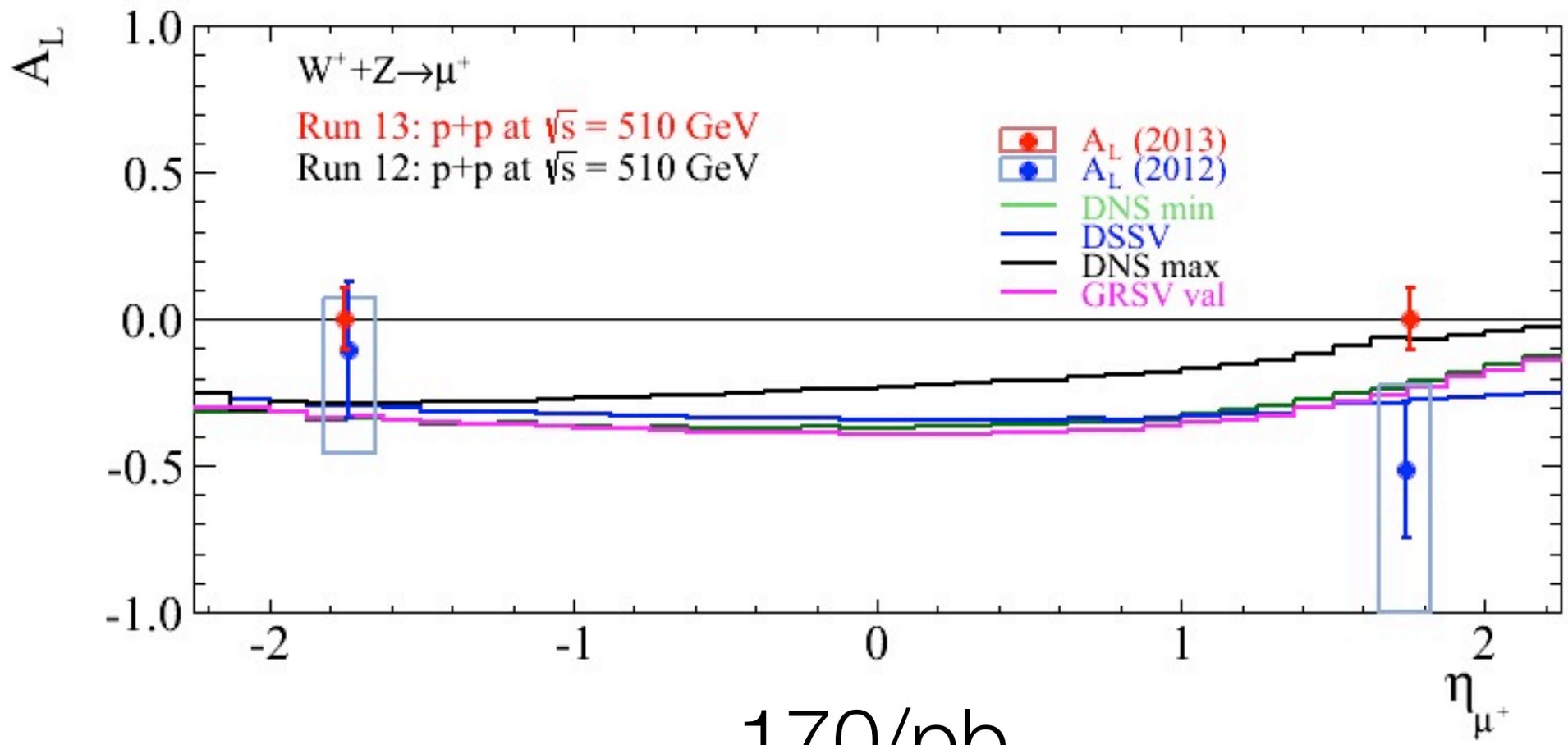
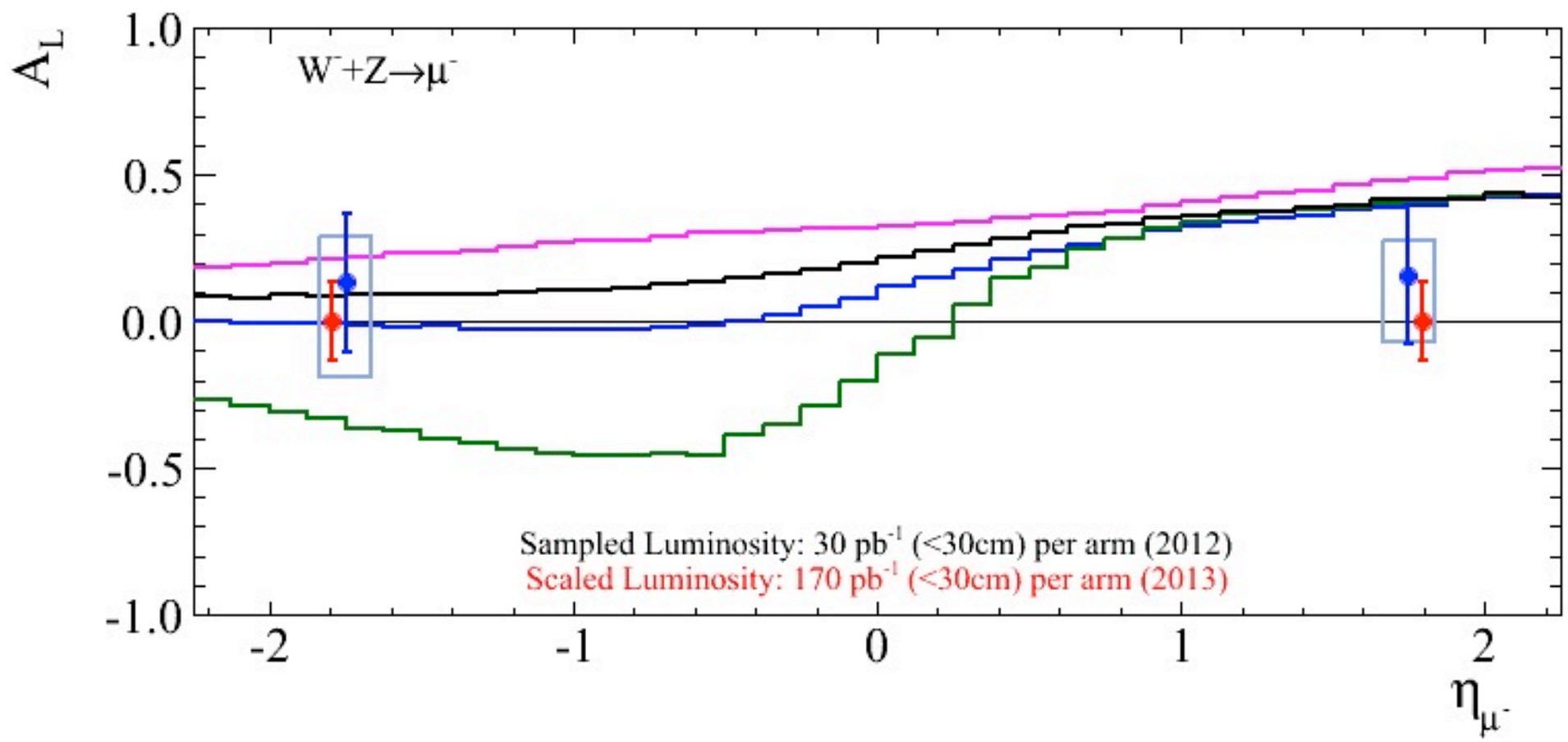
Run 12: p+p at $\sqrt{s}$ = 510 GeV
A_L (2013)
A_L (2012)
DNS min
DSSV
DNS max
GRSV val
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^+}

121/pb


A_L
$W^- + Z \rightarrow \mu^-$
1.0
0.5
0.0
-0.5
-1.0
Sampled Luminosity: 30 pb^{-1} (<30cm) per arm (2012)
Scaled Luminosity: 121 pb^{-1} (<30cm) per arm (2013)
-2
-1
0
1
2
η_{μ^-}


A_L
$W^+ + Z \rightarrow \mu^+$
Run 13: p+p at $\sqrt{s}$ = 510 GeV
Run 12: p+p at $\sqrt{s}$ = 510 GeV
A_L (2013)
A_L (2012)
DNS min
DSSV
DNS max
GRSV val
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^+}

170/pb


A_L
$W^- + Z \rightarrow \mu^-$
Sampled Luminosity: 30 pb^{-1} (<30cm) per arm (2012)
Scaled Luminosity: 170 pb^{-1} (<30cm) per arm (2013)
1.0
0.5
0.0
-0.5
-1.0
-2
-1
0
1
2
η_{μ^-}