# g2p Runplan for E=3350 MeV, 5.0 T Target oriented at 90°

**General Instructions for the Shift Leader**

- Shift HowTos are described on the wiki.
- Watch the Septa striptools. Post **any** fluctuations to the logbook and immediately notify the RC.
- Atleast once per shift check the septa currents using **GetSeptaCurrent**.
- Perform a bleed-thru measurement atleast **once per shift** (please really do this).
- Acknowledge the DAQ popup messages for every run. Otherwise, the end of run scripts fail.
- RHRS takes *long* time to settle to a new momentum. Don't wait to begin the LHRS DAQ.
- Keep the beam current in the range **50-100 nA, with deadtime <25%**.
- The current and prescales in the Table should be a good starting point, but they may need to be tweaked for optimal running: Use the lowest current and prescale possible, while maintaining the maximum DAQ rate. **6.5 kHz is about the best we can expect with reasonable deadtime.**
- Log all changes to the active waveplate: IHWP1 is the only one that matters to g2p.
- If the magnitude of the polarization $|P_T|$ drops below 60%, call the Target on Call.
- The Nevts listed in the Table assumes $P_T = 70\%$. If the average polarizations differ significantly from expectation, scale Nevts needed by a factor $(70/P_T)^2$. Confirm with the Run coordinator before making any large adjustment.

**Dilution Runs (only after production is complete!)**

Take 0.5 M total events or 5 mins (**whichever is faster**) in each configuration. Use left arm only.

1. **Dilution Runs with Helium** : What to take:
   - Home position ('Empty'), Both rasters ON.
   - Carbon Target, Both rasters ON.
   - Dummy Target ('Cross Hairs'), Both rasters ON.

## Production Running

1. Move to production: Request the current listed in the Table, with slow and fast raster ON.
2. Verify that the Septa Current matches the spectrometer momenta using **GetSeptaCurrent**.
3. Adjust Prescalers and current to maximize T1 and T3 rate with deadtime below 25%.
4. Start Left, Right and 3rd Arm DAQ runs. Try to keep the runs reasonably synced in time.
5. Collect the number of events needed for the current momentum setting.

| $P_0$ (GeV) | $\Theta$ | W (GeV) | I (nA) | Rate (kHz) | Pre | ABUs (h) | Nevts Goal (M) | $< PT >$ % | Nevts scaled (M) |
|---|---|---|---|---|---|---|---|---|---|
| 3.0000 | 7.4 | 1.170 | 50 | 6.8 | 1 | 3.0 | 69 | | |
| 2.8200 | 7.6 | 1.308 | 62 | 6.5 | 1 | 0.0 | 0 | | |
| 2.6508 | 7.7 | 1.425 | 75 | 5.5 | 1 | 3.0 | 59 | | |
| 2.4918 | 7.9 | 1.527 | 75 | 4.5 | 1 | 3.1 | 49 | | |
| 2.3422 | 8.1 | 1.617 | 75 | 3.5 | 1 | 4.0 | 50 | | |
| 2.2017 | 8.3 | 1.697 | 75 | 2.8 | 1 | 2.3 | 22 | | |
| 2.0696 | 8.5 | 1.769 | 75 | 2.2 | 1 | 5.5 | 43 | | |
| 1.9454 | 8.8 | 1.834 | 75 | 1.7 | 1 | 6.7 | 42 | | |
| | | | | | **ABU days** | **0.6** | | | |
| | | | | | **Real days** | **1.1** | | | |
| | | | | | **Total days** | **1.6** | | | |

| Overhead | Number | Time Per (hr) | (hr) |
|---|---|---|---|
| Target anneal | 3 | 2.5 | 7.5 |
| Momentum change | 8 | 0.50 | 4.0 |
| Dilution/P.F. | 4 | 0.50 | 2.0 |
| | | | 0.6 days |

README

- Start left arm production at 2.3422 and proceed to higher momenta, cycling as you go. Start right arm production at 2.2017 and proceed to lower momenta.
- The average target polarization is assumed to be 70%, so 'Nevts scaled' = Number of raw events collected, scaled by factor $(\frac{70}{<P_T>})^2$
- ABU times for each momentum setting shown above assume single arm data taking.
- Dilution runs are to be performed **ONLY AFTER ALL PRODUCTION IS COMPLETE**. Change only the left arm dipole settings and septa. For the P0$\leq$ 2.2017 dilution runs, turn off the right arm septa regulation and match the right arm septa field to the left septa field by hand. When the left arm P0 is greater than 2.2017, leave the right arm septa wherever it is.
- Use 100 nA for dilution runs. Each run must be no longer than 5 (beam on) mins each.
- We already have dilution runs for P0=2.8200 and 2.2017 GeV/c. Do not repeat.
- If you complete this runplan, take 40M events at P0=1.8287 for right arm, and take 60M events with left arm at 2.9200 GeV/c.

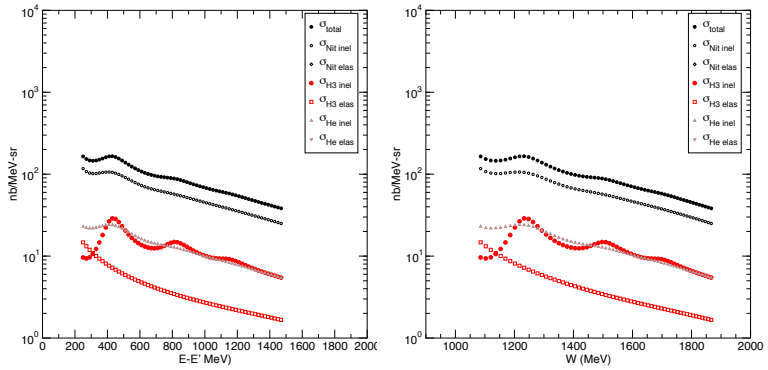


Figure 1: Cross section.

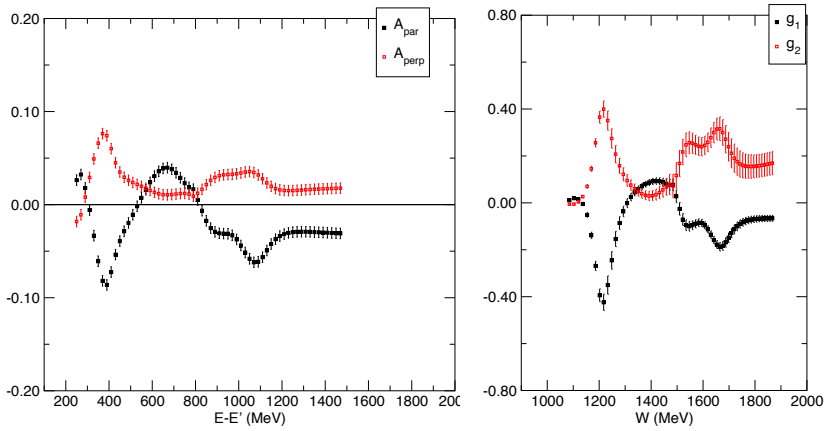


Figure 2: **LEFT:** Predicted Physics Asymmetries (MAID). Measured asymmetries will be suppressed by $A_{meas} = fP_bP_TA_{phys} \approx A_{phys}/11$ **RIGHT:** Predicted structure functions.

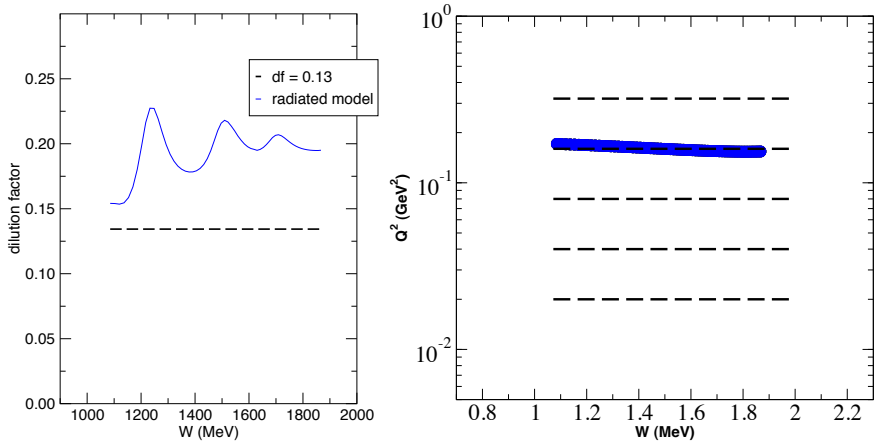


Figure 3: **Left:** Dilution Factor Estimate. **Right :** Kinematic coverage.