

## PrimEx-D Run Plan (August - December 2022)

**Duration of the run:** Aug 27 – Dec 19, 113 days

### General conditions:

- $10^{-4}$  R.L. Al radiator for production runs,  $2 \cdot 10^{-5}$  R.L. Al radiator for CCAL calibration and TAC runs
- 5 mm collimator, 750  $\mu$ m Be PS converter
- Targets: Be and LHe4
- Solenoid magnet switched ON for most production runs except Compton calibration runs on Be target (see below), all sub-detectors are switched on
- Beam current and conditions for drift chambers

Solenoid Magnet ON, production on He target

CDC / FDC	ON	200 nA
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Solenoid Magnet OFF, Compton Calibration on Be target

CDC / FDC	OFF	200 nA
CDC / FDC	ON	50 nA, 100 nA

**Trigger type:** CCAL & FCAL, FCAL, FCAL & ST (TBD)  
PS, random, front panel LEDs

**Sequence of the planned work:** see the Table on the next page:

### Beam Restoration and Detector Calibration

	Time (shifts)	Beam current (nA)	Radiator ( $X_0$ )	CCAL position	TAC position	Solenoid field	CDC/FDC
<b>No target</b>							
-Tune beam to tagger Hall	3			retracted	retracted	on	on
-Ion chamber calibration	0.6						
Radiation Monitor check							
-Harp scan for the electron beam	0.3						
- Radiation Monitor check	0.2	10-100	$10^{-4}$				
- PS harp scan	0.2	10-100	$10^{-4}$				
- Active collimator check	0.5						
Initial detector check out - TAGH, PS voltage scan - TAGM voltage scan, CCAL, TAC	1	10-100	$10^{-4}$	inserted	retracted		
Equalize CCAL gains (calibrate CCAL)	8	$\sim 2$	$2 \cdot 10^{-5}$	Snake scan in the beam	inserted		
TAC run	2	$\sim 2$	$2 \cdot 10^{-5}$	in the beam	inserted		
Production on Be empty target	2	200	$10^{-4}$	inserted	retracted	on	on
<b>Switch off solenoid magnet (target change)</b>	1.5	50	$10^{-4}$	inserted		ramping down	on

**Total**                       $\sim 5$  days

### Production on Be target

	Time (shifts)	Beam current (nA)	Radiator ( $X_0$ )	CCAL position	TAC position	Solenoid field	CDC/FDC
<b>Install Be target mount, install ST, align</b>	3					off	on
<b>Switch on solenoid magnet</b>	1.5	50	$10^{-4}$	inserted	retracted		
Trigger and DAQ study for physics	2	10-100	$10^{-4}$			on	on
Detector checkout and calibration - raw mode for ADCs Take data for FCAL gain equalization and calibration	3	10-100	$10^{-4}$				
FCAL HV tuning	1						
<b>Data production</b>							
Compton run at small beam current (Be target)	2	50	$10^{-4}$				
	2	100					
Compton run at the nominal beam current	8	200	$10^{-4}$				
<b>Switch off solenoid magnet</b>	1.5	50	$10^{-4}$			Ramping down	
FDC straight track run	0.5	50	$10^{-4}$			off	on
Compton run at small beam intensity (Be target)	2	50	$10^{-4}$			off	on
Compton run at the nominal beam current	4	200	$10^{-4}$			off	off

**Total**

~7.5 days

### Production on LHe target

	Time (shifts)	Beam current (nA)	Radiator (X <sub>0</sub> )	CCAL position	TAC position	Solenoid field	CDC/FDC
<b>Install LH4 target mount, install ST, align</b>	3					off	off
<b>Fill the target Switch on solenoid magnet</b>	1.5						
Production run at the nominal luminosity	5	200	10 <sup>-4</sup>	inserted	retracted	on	on
Production run at small Luminosity	2	50	10 <sup>-4</sup>				
	2	100					
High luminosity run (optional)	2	400	10 <sup>-4</sup>				
Alternate production runs with the empty target runs 70 % / 30 %	the rest of the run	200	10 <sup>-4</sup>				

<b>Study systematics</b>							
Second TAC run at the end of the experiment	2						
Take Compton data with the reduced PS magnetic field. A TAC run will be needed when the field is changed (optional)	2 - 3						
Runs to evaluate trigger efficiency (TDB)	1						

Time is estimated assuming that the accelerator beam efficiency is better than 50 %.

One shift corresponds to 6 hours

#### Detector preparation: