

# $x > 1$ and EMC Effect (XEM2) Run Plan

October 13, 2022

# 1 XEM2 Production Run Plan - Part I

## 1.1 Charge Symmetric Background Studies at 20°- Part I

- **BEWARE:** the POLARITY is STILL POSITIVE
- **SHMS S1X (1-7) and S2X (1-7) on BOTH left and right sides are OFF**

### 1.1.1 Setting 1

- Turn the **SHMS S1X (1-7) and S2X (1-7) LEFT and RIGHT** hodoscope paddles **OFF**.
- Set **HMS momentum** to **+3.40 GeV**.
- **SHMS angle:** 8°
- **SHMS momentum:** +9.2 GeV
- **HMS angle:** 20°
- **Trigger:** SHMS/HMS PS3 (ELCLEAN) **OR** SHMS/HMS PS1 (3/4)
- **Important note on the prescales:** All the other prescales that are NOT specified on each row at the Table 1 should be set to **-1**.
- **Prescale values are only estimated; adjust them on both SHMS and HMS Prescale GUIs accordingly to keep the rates below 3 kHz.**
- Take data with the SHMS and HMS simultaneously.

Table 1: CSB Studies at 20° - Setting 1

Target	$I$ ( $\mu A$ )	HMS PS			SHMS PS			Est. Time	Done ?
		PS1	PS2	PS3	PS1	PS2	PS3		
LD2	60	-1	-1	0	-1	-1	0	10 min	
12C	60	-1	-1	0	-1	-1	0	10 min	
12C	60	0	-1	-1	0	-1	-1	10 min	
40Ca	60	0	-1	-1	0	-1	-1	10 min	
40Ca	60	-1	-1	0	-1	-1	0	10 min	

### 1.1.2 Setting 2

- Make sure **SHMS S1X (1-7)** and **S2X (1-7)** LEFT and RIGHT hodoscope paddles are **OFF**.
- Set **HMS momentum** to **+3.04 GeV**.
- **SHMS angle:**  $8^\circ$
- **SHMS momentum:** **+9.2 GeV**
- **HMS angle:**  $20^\circ$
- **Trigger:** SHMS/HMS PS3 (ELCLEAN) **OR** SHMS/HMS PS1 (3/4)
- **Important note on the prescales:** All the other prescales that are NOT specified on each row at the ?? should be set to -1.
- **Prescale values are only estimated; adjust them on both SHMS and HMS Prescale GUIs accordingly to keep the rates below 3 kHz.**
- Take data with the SHMS and HMS simultaneously.

Table 2: CSB Studies at  $20^\circ$  - Setting 2

Target	$I$ ( $\mu A$ )	HMS PS			SHMS PS			Est. Time	Done ?
		PS1	PS2	PS3	PS1	PS2	PS3		
40Ca	60	-1	-1	0	-1	-1	0	10 min	
40Ca	60	0	-1	-1	0	-1	-1	10 min	
12C	60	0	-1	-1	0	-1	-1	10 min	
12C	60	-1	-1	0	-1	-1	0	10 min	
LD2	60	-1	-1	0	-1	-1	0	10 min	

### 1.1.3 Setting 3

- Make sure **SHMS S1X (1-7)** and **S2X (1-7)** LEFT and RIGHT hodoscope paddles are **OFF**.
- Set **HMS momentum** to **+2.71 GeV**.
- **SHMS angle:**  $8^\circ$
- **SHMS momentum:** **+9.2 GeV**
- **HMS angle:**  $20^\circ$
- **Trigger:** SHMS/HMS PS3 (ELCLEAN) **OR** SHMS/HMS PS1 (3/4)

- **Important note on the prescales:** All the other prescales that are NOT specified on each row at the Table 3 should be set to **-1**.
- **Prescale values are only estimated; adjust them on both SHMS and HMS Prescale GUIs accordingly to keep the rates below 3 kHz.**
- Take data with the SHMS and HMS simultaneously.

Table 3: CSB Studies at 20° - Setting3

Target	$I$ ( $\mu A$ )	HMS PS			SHMS PS			Est. Time	Done ?
		PS1	PS2	PS3	PS1	PS2	PS3		
LD2	60	-1	-1	0	-1	-1	0	10 min	
LH2	60	-1	-1	0	-1	-1	0	10 min	
12C	60	0	-1	-1	0	-1	-1	10 min	
12C	60	-1	-1	0	-1	-1	0	10 min	
Ca40	60	-1	-1	0	-1	-1	0	10 min	
Ca40	60	0	-1	-1	0	-1	-1	10 min	

#### 1.1.4 Setting 4

- Make sure **SHMS S1X (1-7)** and **S2X (1-7)** LEFT and RIGHT hodoscope paddles are **OFF**.
- Set **HMS momentum** to **+2.421 GeV**.
- **SHMS angle:**  $8^\circ$
- **SHMS momentum:** **+9.2 GeV**
- **HMS angle:**  $20^\circ$
- **Trigger:** SHMS/HMS PS3 (ELCLEAN) **OR** SHMS/HMS PS1 (3/4)
- **Important note on the prescales:** All the other prescales that are NOT specified on each row at the Table 4 should be set to **-1**.
- **Prescale values are only estimated; adjust them on both SHMS and HMS Prescale GUIs accordingly to keep the rates below 3 kHz.**
- Take data with the SHMS and HMS simultaneously.
  
- Total estimated time for section 2.3 including the momentum and target changes: **16.5 hrs**. Estimated run times are with 100% efficiency.

Table 4: CSB Studies at 20° - Setting 4

Target	$I$ ( $\mu\text{A}$ )	HMS PS			SHMS PS			Est. Time	Done ?
		PS1	PS2	PS3	PS1	PS2	PS3		
Ca40	60	-1	-1	0	-1	-1	0	10 min	
Ca40	60	0	-1	-1	0	-1	-1	10 min	
Be9	60	0	-1	-1	0	-1	-1	10 min	
Be9	60	-1	-1	0	-1	-1	0	10 min	
Al dummy	40	-1	-1	0	-1	-1	0	10 min	
Al dummy	40	0	-1	-1	0	-1	-1	10 min	
LD2	60	0	-1	-1	0	-1	-1	10 min	
LD2	60	-1	-1	0	-1	-1	0	10 min	
LH2	60	-1	-1	0	-1	-1	0	10 min	
LH2	60	0	-1	-1	0	-1	-1	10 min	
Ca48	60	0	-1	-1	0	-1	-1	10 min	
Ca48	60	-1	-1	0	-1	-1	0	10 min	
C12	60	-1	-1	0	-1	-1	0	10 min	
C12	60	0	-1	-1	0	-1	-1	10 min	
B4C-11	60	0	-1	-1	0	-1	-1	10 min	
B4C-11	60	-1	-1	0	-1	-1	0	10 min	
B4C-10	60	-1	-1	0	-1	-1	0	10 min	
B4C-10	60	0	-1	-1	0	-1	-1	10 min	
Sn (Tin)	40	-1	-1	0	-1	-1	0	10 min	
Sn (Tin)	40	0	-1	-1	0	-1	-1	10 min	
Titanium	40	0	-1	-1	0	-1	-1	10 min	
Titanium	40	-1	-1	0	-1	-1	0	10 min	
54Fe	40	-1	-1	0	-1	-1	0	10 min	
54Fe	40	0	-1	-1	0	-1	-1	10 min	
108Ag	60	0	-1	-1	0	-1	-1	10 min	
108Ag	60	-1	-1	0	-1	-1	0	10 min	
232Thorium	60	-1	-1	0	-1	-1	0	10 min	
232Thorium	60	0	-1	-1	0	-1	-1	10 min	
Ni58	60	0	-1	-1	0	-1	-1	10 min	
Ni58	60	-1	-1	0	-1	-1	0	10 min	
Ni64	60	-1	-1	0	-1	-1	0	10 min	
Ni64	60	0	-1	-1	0	-1	-1	10 min	