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
- For the entire section of 1.3: **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	H	IMS P	S	SI	HMS I	PS	Est. Time	Done?
	(μA)	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°

• 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 ?? 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° - Setting 2

${f Target}$	$\mid I \mid$	\parallel H	IMS P	\mathbf{S}	SI	HMS I	\mathbf{PS}	Est. Time	Done?	
	(μA)	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°

• 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 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° - Setting 3

Table 5. OBD brudies at 20 - Settings										
Target	I	H	IMS P	S	SI	HMS I	PS	Est. Time	Done?	
	(μA)	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°
- 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 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					ies at 20° - Setting 4					
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 Al dummy 40 -1 -1 0 -1 -1 0 10 min Al dummy 40 0 -1 -1 0 -1 -1 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 10 min LB2 60 -1 -1 0 -1 -1 10 min LH2 60 0 -1 -1 0 -1 -1 10 min Ca48 60	${\rm Target} \qquad I$					1		I	Est. Time	Done?
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 LD2 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 0 10 min		(μA)	PS1	PS2	PS3	PS1	PS2	PS3		
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 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 LH2 60 0 -1 -1 0 -1 -1 10 min Ca48 60 0 -1 -1 0 -1 -1 10 min Ca48 60 0 -1 -1 0 -1 -1 10 min C12 60 0 -1 -1 0 -1 -1 10 min C12 60 0 -1 -1 0 -1 -1 10 min C12 60 0 -1 -1 0 -1 -1 10 min B4C-11 60 0 -1 -1 0 -1 -1 10 min B4C-10 60 -1 -1 0 -1 -1 0 10 min B4C-10 60 0 -1 -1 0 -1 -1 10 min B4C-10 60 0 -1 -1 0 -1 -1 10 min B7 (Tin) 40 0 -1 -1 0 -1 -1 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 0 -1 -1 0 -1 -1 10 min S4Fe 40 0 -1 -1 0 -1 -1 10 min 108Ag 60 0 -1 -1 0 -1 -1 10 min Ni58 60 0 -1 -1 0 -1 -1 10 min Ni58 60 0 -1 -1 0 -1 -1 10 min Ni58 60 0 -1 -1 0 -1 -1 10 min Ni64 60 -1 -1 0 -1 -1 0 10 min				_	0		_			
Be9	Ca40	60	0	-1	-1	0	-1	-1	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 LH2 60 0 -1 -1 0 -1 -1 10 min Ca48 60 0 -1 -1 0 -1 -1 10 min C12 60 0 -1 -1 0 -1 -1 10 min B4C-11 60 0 -1 -1 0 -1 -1 10 min	Be9	60	0	-1	-1		-1	-1	10 min	
Al dummy	Be9	60	-1	-1	0	-1	-1	0	10 min	
LD2		40	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Al dummy	40	0	-1	-1	0	-1	-1	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 C12 60 0 -1 -1 0 -1 -1 10 min B4C-11 60 0 -1 -1 0 -1 -1 0 10 min B4C-10 60 0 -1 -1 0 -1 -1 0 10 min Sn (Tin) 40 -1 -1 0 -1 -1 0	LD2	60	0	-1	-1	0	-1	-1	10 min	
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		60	-1	-1		-1	-1	I I	10 min	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	LH2	60	0	-1	-1	0	-1	-1	10 min	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ca48	60	0	-1	-1	0	-1	-1	10 min	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ca48	60	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C12	60	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C12	60	0	-1	-1	0	-1	-1	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		60	0	-1	-1	0	-1	-1	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	B4C-11	60	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		60	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	B4C-10	60	0	-1	-1	0	-1	-1	10 min	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sn (Tin)	40	-1	-1	0	-1	-1	0	10 min	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Sn (Tin)	40	0	-1	-1	0	-1	-1	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Titanium	40	0	-1	-1	0	-1	-1	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Titanium	40	-1	-1	0	-1	-1	0	10 min	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	54Fe	40	-1	-1	0	-1	-1	0	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	54Fe	40	0	-1	-1	0	-1	-1	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	108Ag	60	0	-1	-1	0	-1	-1	10 min	
232Thorium 60 0 -1 -1 0 -1 -1 10 min	108Ag	60	-1	-1	0	-1	-1	0	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		60	-1	-1	0	-1	-1	0	10 min	
Ni58 60 -1 -1 0 -1 -1 0 10 min Ni64 60 -1 -1 0 -1 -1 0 10 min	232Thorium	60	0	-1	-1	0	-1	-1	10 min	
Ni64 60 -1 -1 0 -1 -1 0 10 min	Ni58	60	0	-1	-1	0	-1	-1	10 min	
	Ni58	60	-1	-1	0	-1	-1	0	10 min	
Ni64 60 0 -1 -1 0 -1 10 min	Ni64	60	-1	-1	0	-1	-1	0	10 min	
	Ni64	60	0	-1	-1	0	-1	-1	10 min	