

2021 Trigger Commissioning Plan

1. Test the Moller trigger
 - Test the trigger cuts of the Moller trigger
 - DAQ: PROD77_NOSVT
 - Trigger file: [moller_test.trg](#)
 - Target 8 um
 - Beam current 300 nA
 - 5 minutes with beam. Record the trigger GUI!
2. Hodoscope only trigger
 - Test the single calorimeter trigger from positron side
 - DAQ: PROD77_NOSVT
 - Trigger file: [hps2021_ValidatePDE_V0.trg](#)
 - Target 8 um
 - Beam current 300 nA
 - Number of events 100M (around one our beam time)
 - Record the trigger GUI
3. Calorimeter only trigger
 - Test the production trigger logics: ECAL and Hodo
 - DAQ: PROD77_NOSVT
 - Trigger file: [hps2021_Validate_Prod.trg](#)
 - Target 8 um
 - Beam current 300 nA
 - Number of events 100M (around one our beam time)
 - Record the trigger GUI

There are two possibility to take random trigger: FC and generator @30 kHz.

The FC rate with beam blocker IN is only 7.5 kHz at 270 nA and 8 um target.

If we prefer to use FC trigger we will need to go to 20 um target, beam blocker off and current around 40 nA only. It is not working conditions. From this point of view, we can go to generator trigger in case the beam current will be stable enough. Two trigger are described below.

4. Faraday Cup trigger @ max current
 - Determine the absolute trigger efficiency
 - DAQ: PROD77
 - Trigger file: [hps2021_v1_2_FC_random.trg](#)
 - 20 um target
 - Beam blocker OFF
 - Maximum allowed beam current
 - Take data when the SVT will be completely ready

- 4 hours of **BEAM TIME**
 - Record the trigger GUI
5. Random trigger @ max current
- Determine the absolute trigger efficiency
 - DAQ: PROD77
 - Trigger file: [hps2021_v2_1_30kHz_random.](#)
 - Production current
 - Production target
 - Take data when the SVT will be completely ready
 - 4 hours of **BEAM TIME**
 - Record the trigger GUI

Run# -1 Target: 8 um W HPS Triggers Latency 09/03/2021 11:00:04

Beam Currents (nA) 2C21: 270.39 FCup: 77.26 Livetime (%): 97.10

#	Description	Raw Rate (Hz)	Prescaled Rate (Hz)	%	Prescale
00	Single-0 Top	1779294,0	81,0	0,2	20000
01	Moller Top	166231,0	0,0	0,0	0
02	Single-2 Top (e+)	10107,0	10160,0	27,3	1
03	Single-3 Top (e+/Hodo)	7562,0	7647,0	20,5	1
04	Single-0 Bottom	2115354,0	96,0	0,3	20000
05	Moller Bottom	200115,0	0,0	0,0	0
06	Single-2 Bottom (e+)	10783,0	10766,0	28,9	1
07	Single-3 Bottom (e+/Hodo)	7197,0	7278,0	19,5	1
08	Pair-0 (Old e+e-)	17446,0	168,0	0,5	100
09		83650,0	0,0	0,0	0
10		78950,0	0,0	0,0	0
11	Pair-3 (mu+mu-)	366,0	352,0	0,9	1
12	LED	0,0	0,0	0,0	0
13	Cosmic	0,0	0,0	0,0	0
14	Hodoscope	4099392,0	0,0	0,0	0
15	Pulser	100,0	101,0	0,3	1
16		152972,0	0,0	0,0	0
17		6867,0	0,0	0,0	0
18	FEE Top	275,0	282,0	0,8	1
19	FEE Bottom	289,0	299,0	0,8	1

Sum: 37230,00

Front Panel (Hz): Faraday Cup 7342,0 N/A 0,0

FADC Data Rate (MB/s): hps1 55,94 hps2 57,92

