

# Introduction & Updated on the T08 beam data analysis

F. Ravotti (EP-DT) and Kacper Bilko (SY-STI)

1 December 2021

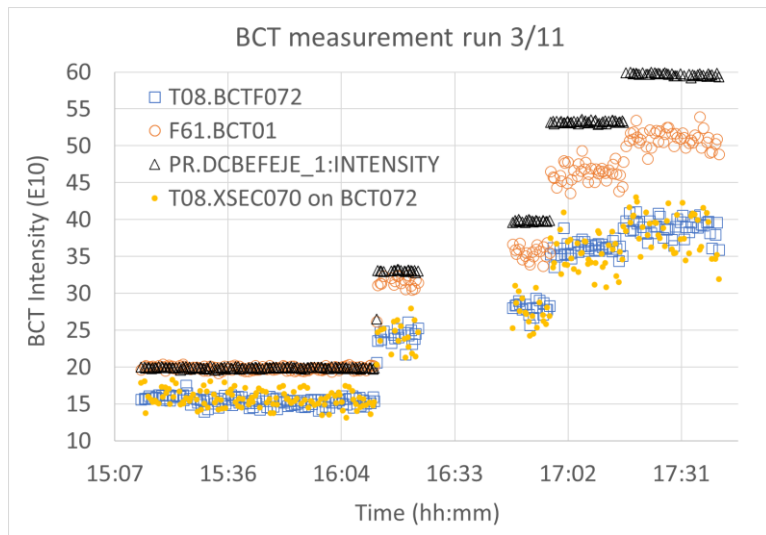
# Introduction

- Finalize / progress on T8 beam data analysis presented previously (<https://indico.cern.ch/event/1099820/>), on our side:
  - understanding calibration of XSEC for EAST\_FAST\_T8 (ongoing)
  - plot intensity data from 9/11 @ 1pm onwards - OK
  - check “new” signal received in IRRAD from XSEC094 - OK
  - check PR.BCT spill data (time) and compare with XSEC070 signal
    - need further input from BE-SY colleagues (if data available?)
- Feedback about measurements performed by various teams, focusing on the work done during the last weekend of operation (Nov. 12<sup>th</sup>-15<sup>th</sup>)
- Understand/plan the **work to be done in the commissioning run 2022**
- Feedback HI measurement of last weekend not discussed today

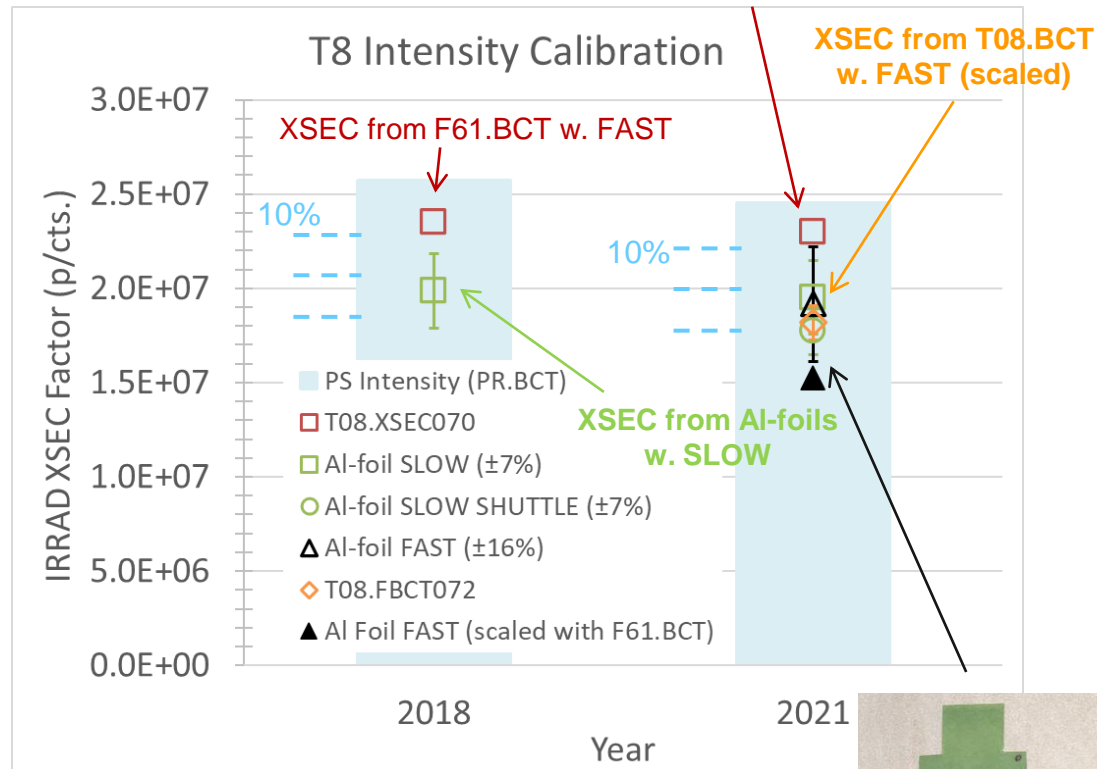
# Total Intensity Calibration

Preliminary

Device T08.	IRRAD SEC F. (old)	New SY-BI SLOW (2021)	New SY-BI FAST (2021)
XSEC070	$2.30 \times 10^7$	$1.27 \times 10^8$	$3.81 \times 10^8$
XSEC094	$1.03 \times 10^8$	$5.08 \times 10^8$	
	4.48	4.8	Assumption!

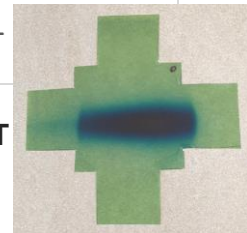


T08.XSEC070

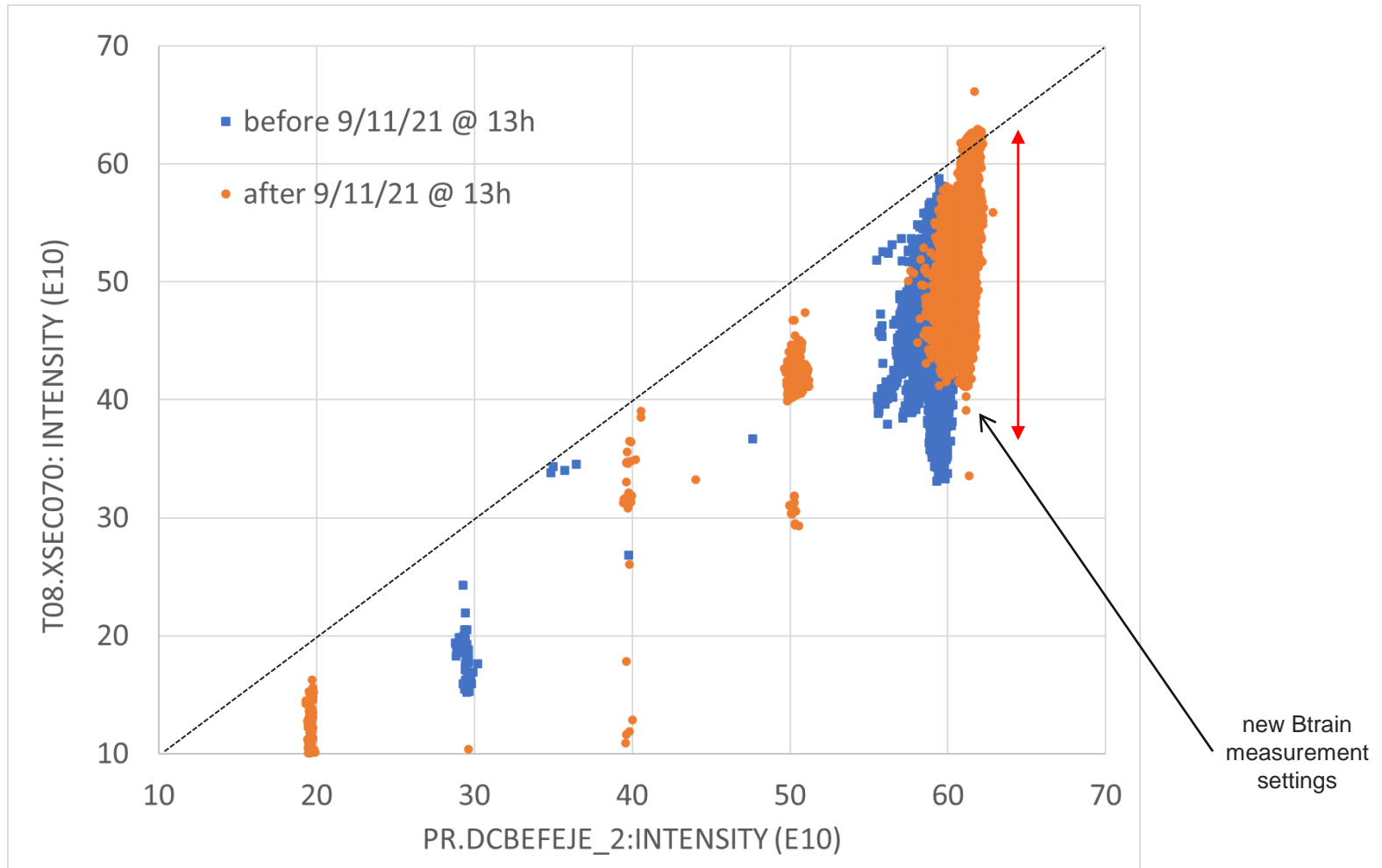


Thanks to Romain, Federico, Ana, Michel! (SY-BI)

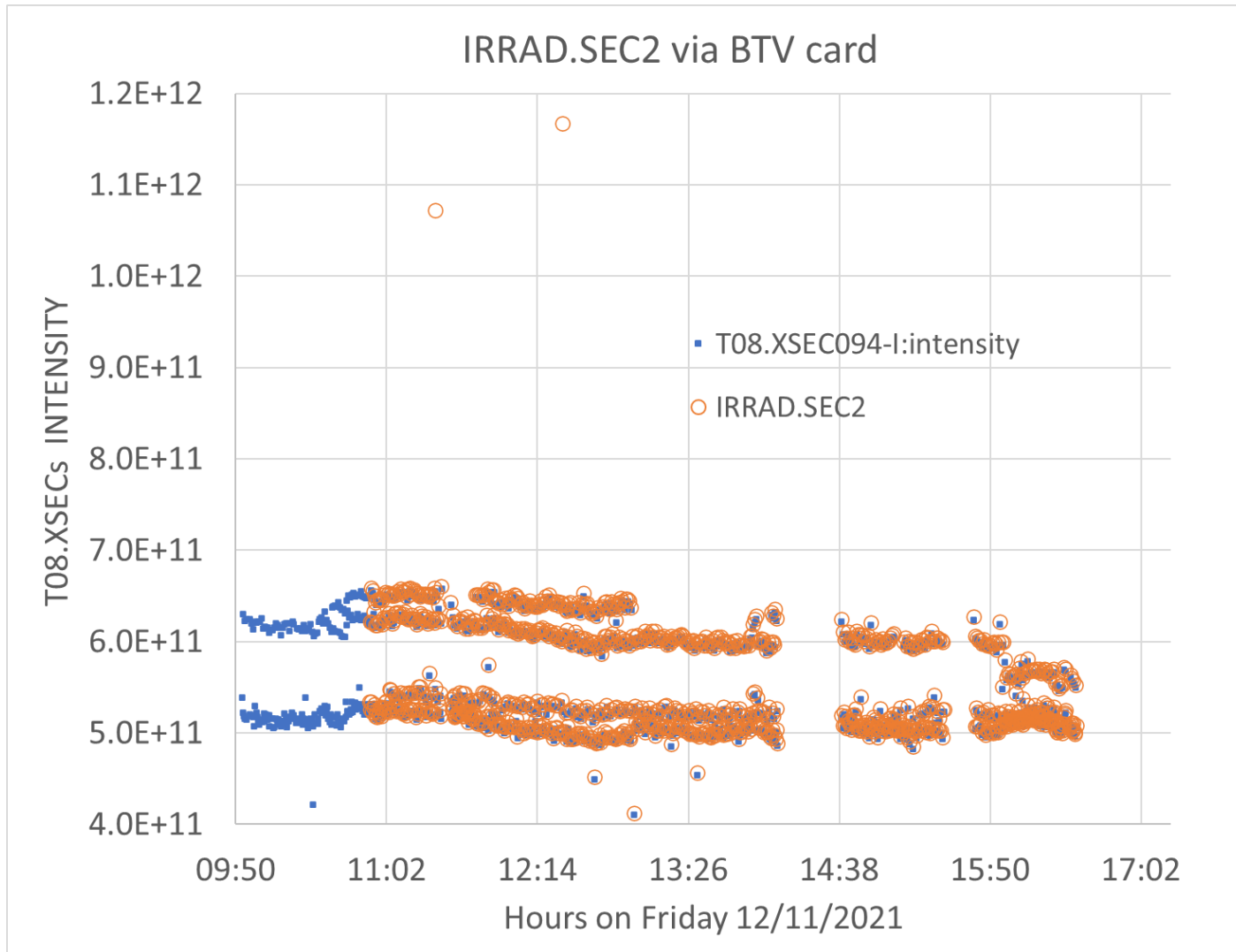
XSEC from Al-foils w. FAST



# Total Intensity Stability after 9/11

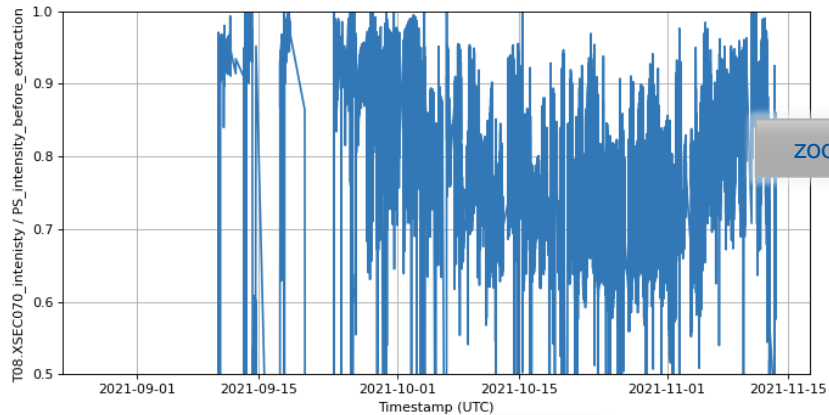


# T08.XSEC094

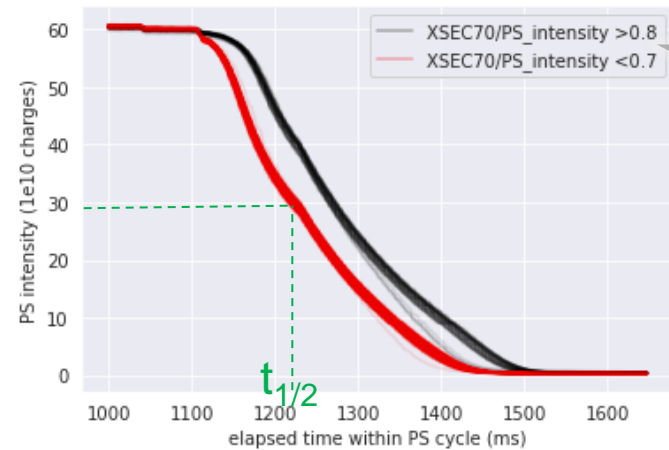
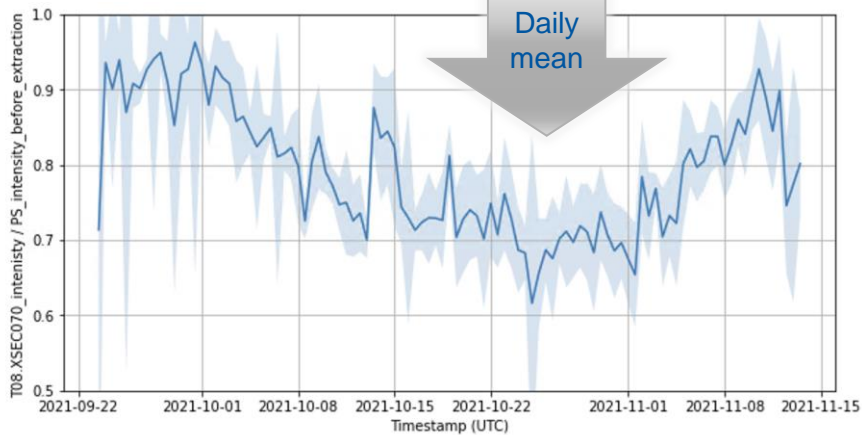
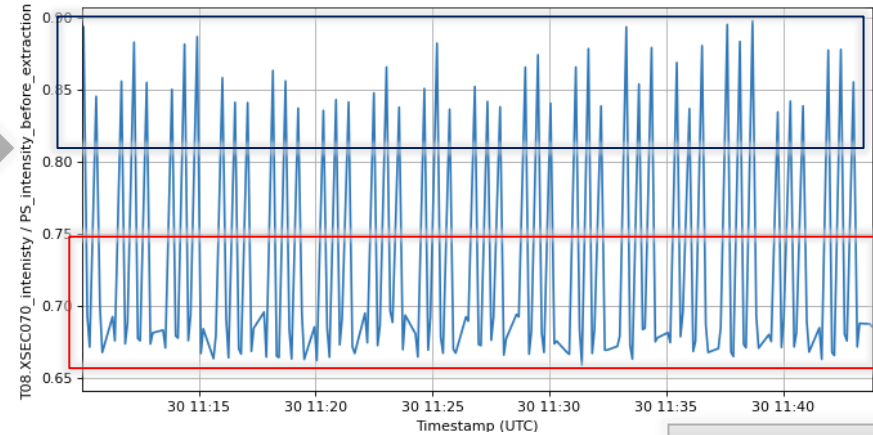


# PR.BCT Data Analysis

- Goal: explain spread from slide 4:

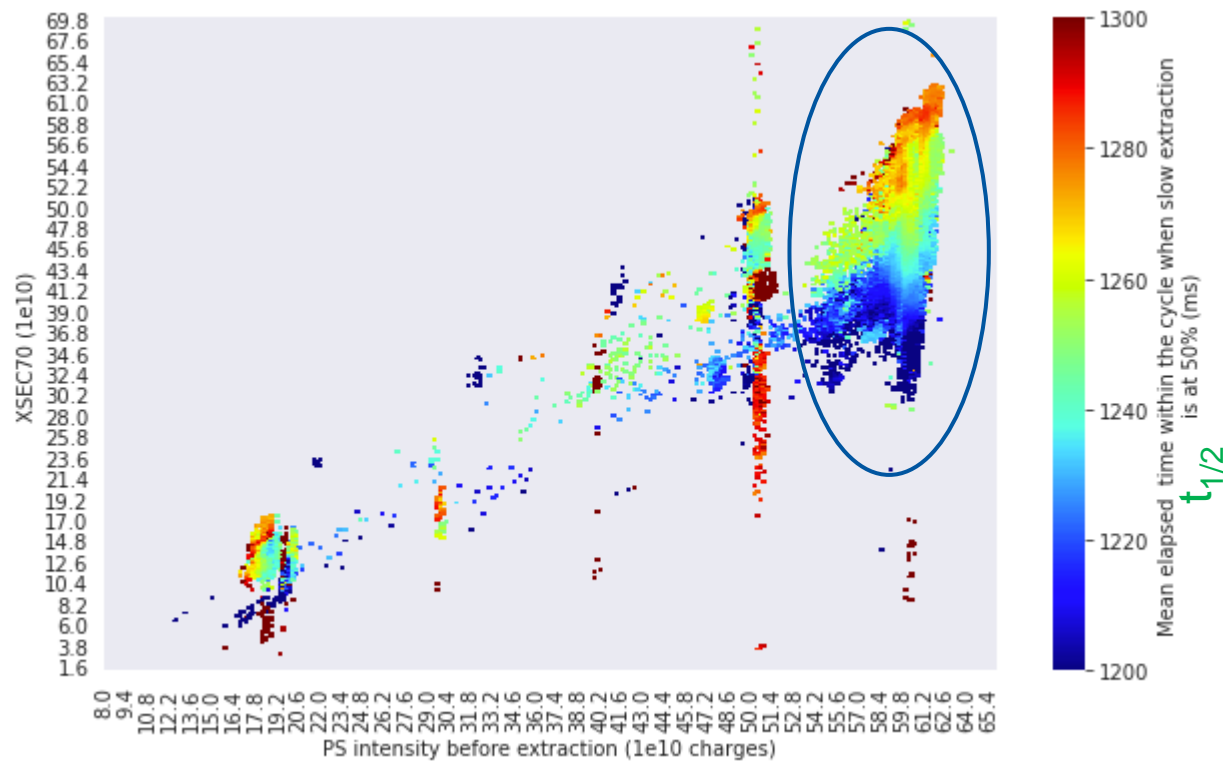


SEC/PS\_intensity ratio is periodic...



# PR.BCT Data Analysis

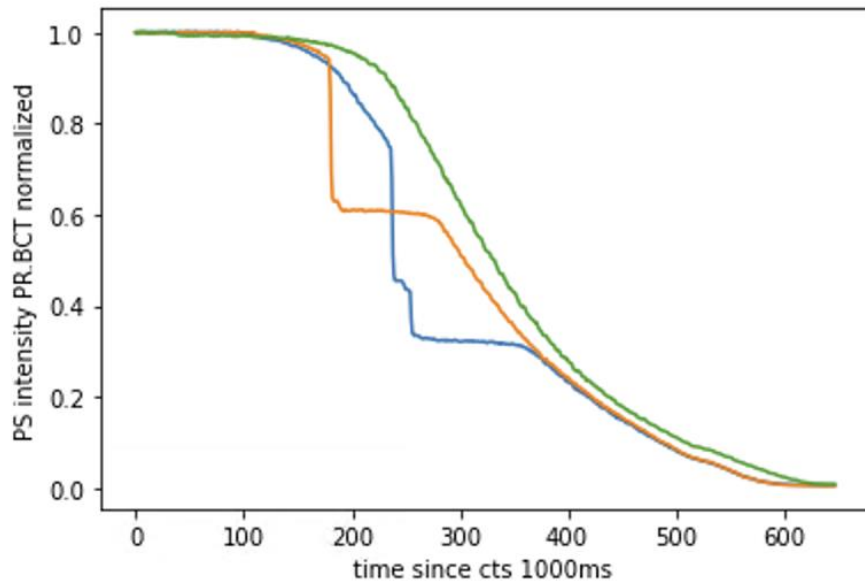
- The fastest spill extraction rate the worse the agreement between SEC and PS\_intensity...



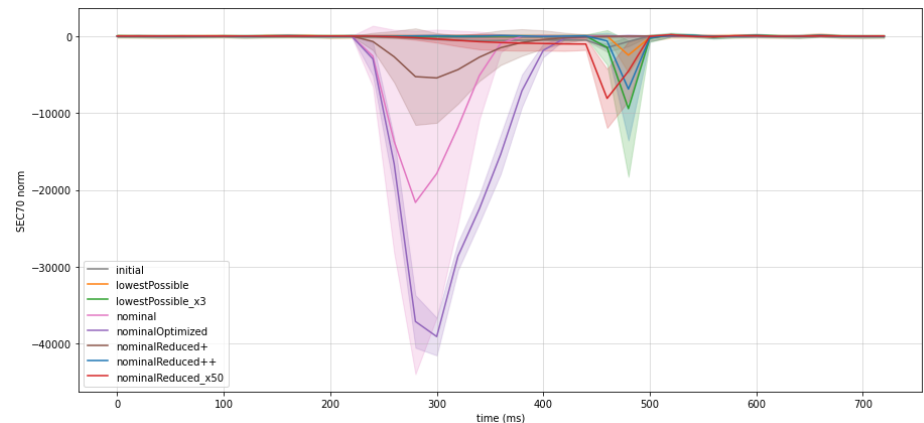
# PR.BCT vs. XSEC070

- Open point: What happens with SEC signal for different “extraction rates” / spills with steps (saturation?)?

Examples of spills with steps



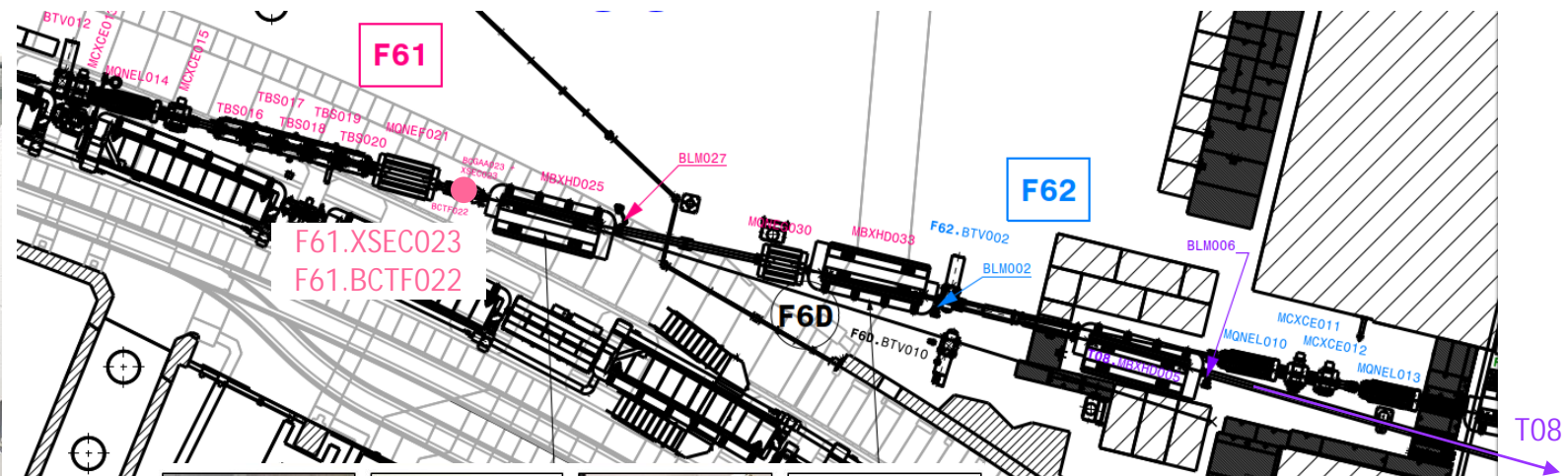
Examples of XSEC70 evolution over spill (ion run)



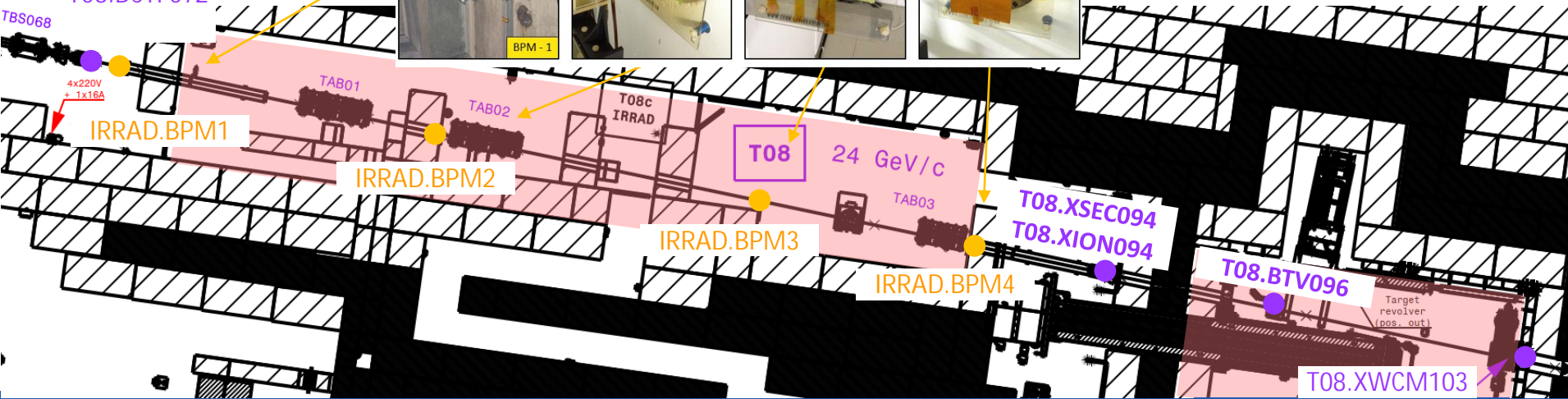
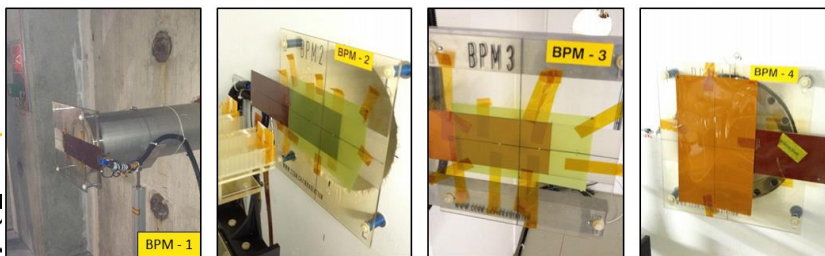


# Previous Slides

# F61 / T08 Beam Instrumentation



T08.XSEC070  
T08.XION071  
T08.BCTF072

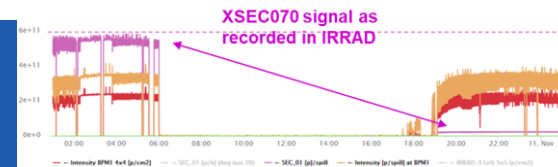
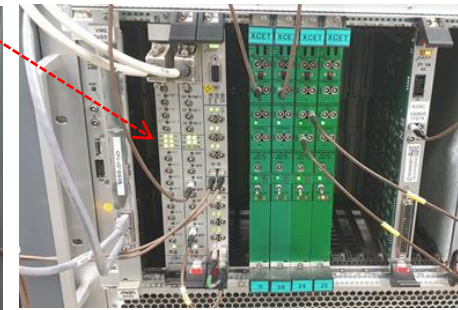
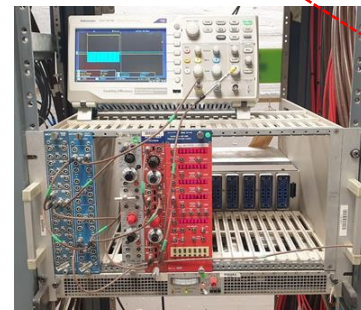


# T08 BI during Proton Operation

- **F61.BCTF022 (BCT01)**
  - **operational** since beginning of October when PS extraction corrected, first validation with **EAST\_FAST\_T8** on Oct. 6th: good agreement with PR.BCT.
- **T08.BCTF072 (new 2021)**
  - second measurement Oct. 19<sup>th</sup>: **operational** but signal not yet “clean”.
  - third measurement Nov. 3<sup>rd</sup>: coupled with Al-foil dosimetry for checking **EAST\_FAST\_T8** vs. **EAST\_T8**.
- **F61.XSEC023**
  - **not yet operational**: raw signal (too high) not understood, work ongoing SY-BI.
- **T08.XSEC070 & T08.XSEC094**
  - **operational** with theoretical calibration factors for **EAST\_T8**.
  - **ongoing calibration** in “integration mode” for **EAST\_FAST\_T8**.
  - **work ongoing** to provide IRRAD with a reliable XSECs signals:
    - **timing card (SY-BI)**: 1-spill delay, background noise, reliability, ...
    - **BTV card (SY-BI)**: synchronous with beam, no noise, being tested on XSEC094
    - **FESA class (IRRAD)**: being implemented & tested
- **T08.XION071 (new 2021) & T08.XION094**
  - **not yet operational** (maybe checked over the weekend ?)
- **T08.BTV096 (CHARM)**
  - **operational**
- **T08.XWCM103 (CHARM)**
  - **operational**, but wiring inversion to be corrected.

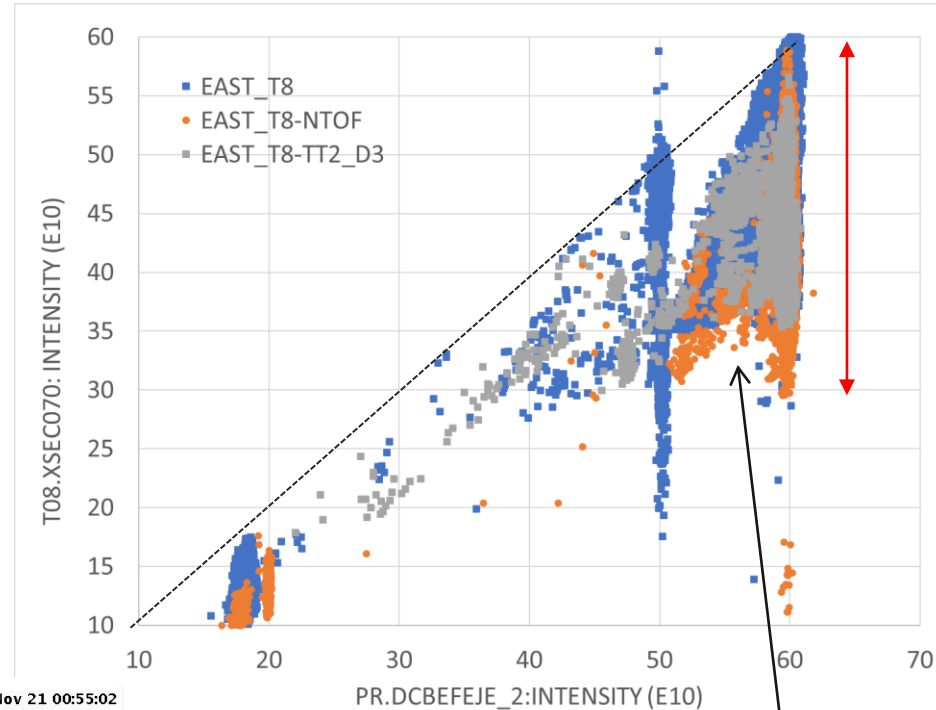
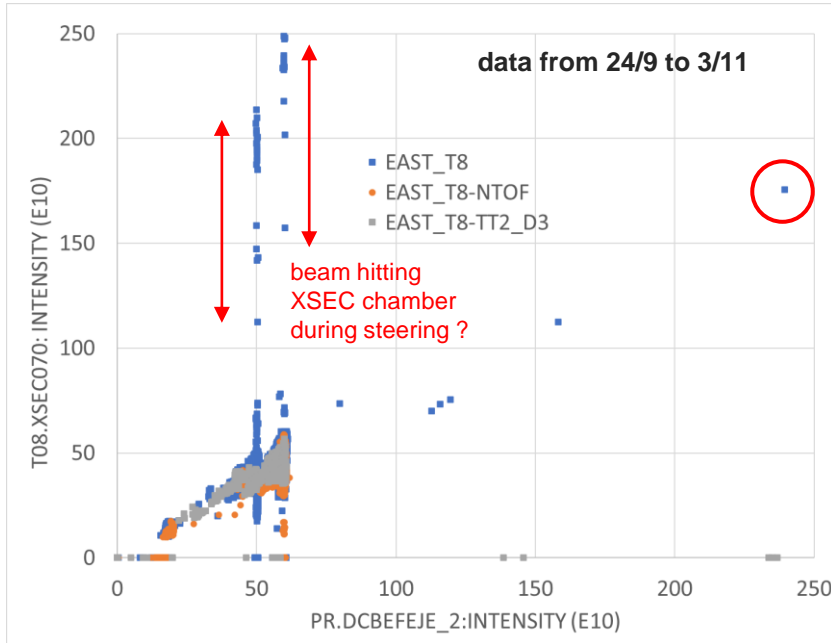


XSECs / XIONs electronics after LS2



# Total Intensity Stability

60e10 vs. 60e10 p/spill area

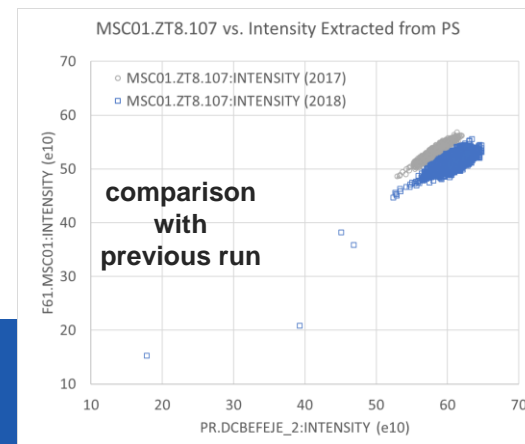


Could not find traces in RP monitoring system (not in-depth search so far, RP working on this)

CPS Tel:76677-W 44 03 Nov 21 00:55:02

	3 Colour range scales: 0.49 - 9 9 - 225 225 - 4500	E10 Charges	Comments (02-Nov-2021 21:54:52)
9	~zero	1	
10	EAST_T8_21	26 253	P+ EAST_T8
12	TOF_21	23 865	P+ NTOF
13	~zero	1	
14	~zero	1	
15	TOF_21	23 859	P+ NTOF
16	TOF_21	23 866	P+ NTOF
17	~zero	1	
18	EAST_T8_21	26 250	P+ EAST_T8
20	EAST_T9_21	3	P+ EAST_T8
/24	EAST_N_21	2	P+ EAST_T9

CCC: 76677 or 76674  
 Coordinator:  
 Helko Damerau  
 162369  
 \*\*\*  
 IRRAD Planning  
 @ 6:00am: beam OFF and  
 area in ACCESS mode  
 @ 8:30am: RP survey and  
 ACCESS to both CHARM  
 and IRRAD



Latest cycles (from the end of Oct. 2021) are more stable