

S-107 High Power Coupler Test

STC, May 24-26, 2018

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Fermilab, TD SRFT&D

SI07 Pre-Test

- 1st cavity tested at STC LPC and HPC from 2014 to 2016
- LPC test in August 2017, pre-qualified, stored in Lab2 CR
- HPC assembly at MP9 on February 2018 failed
 - ▶ found rust at coupler flange studs
- Cleaned in Lab2 CR, HHPR'ed in Lab2 HHPR system, re-assembled with LPC
- Re-tested with LPC in April 2018, pre-qualified
 - ▶ Test results are very similar to these from August 2017
- Assembled with HPC (lossy window) in Lab2
- Tested at STC with HPC on May 23-25 2018
 - ▶ Coupler window heater failed during assembly/cool down

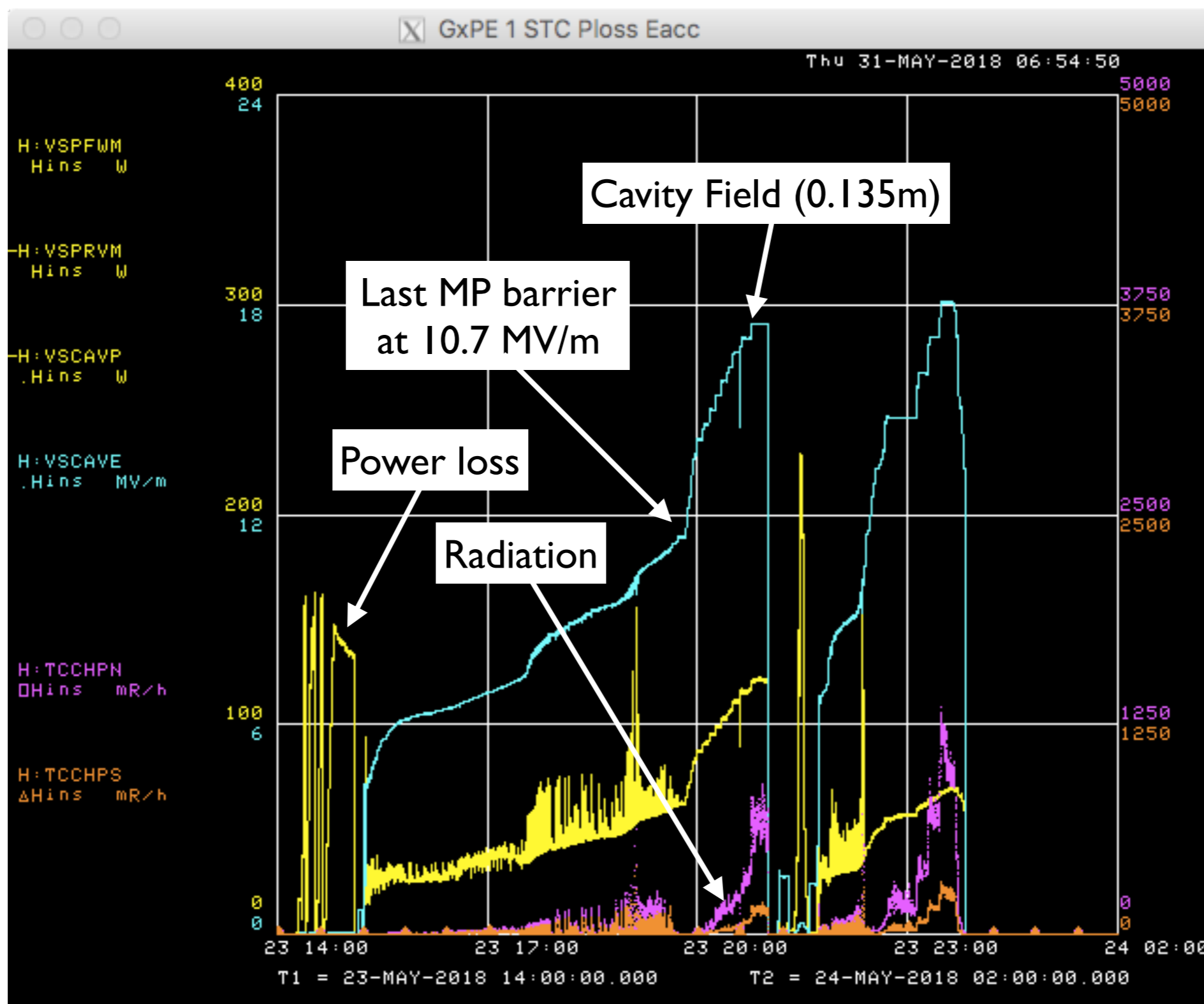
SIH-NR-107

- HPC (CPI-4) assembly [MP9] {2/16-2/20} - **failed** (studs from coupler flange are rusty)
 - ▶ Tech's at ANL CR (Chris and Brent) note that they have seen contamination before when removing studs from these flanges. Nothing as severe as SIH-NR-107 has ever been noted.
 - ▶ Coupler and vacuum port holes are cleaned individually with HP water before US cleaning
 - ▶ Alcohol is added to the studs prior installation



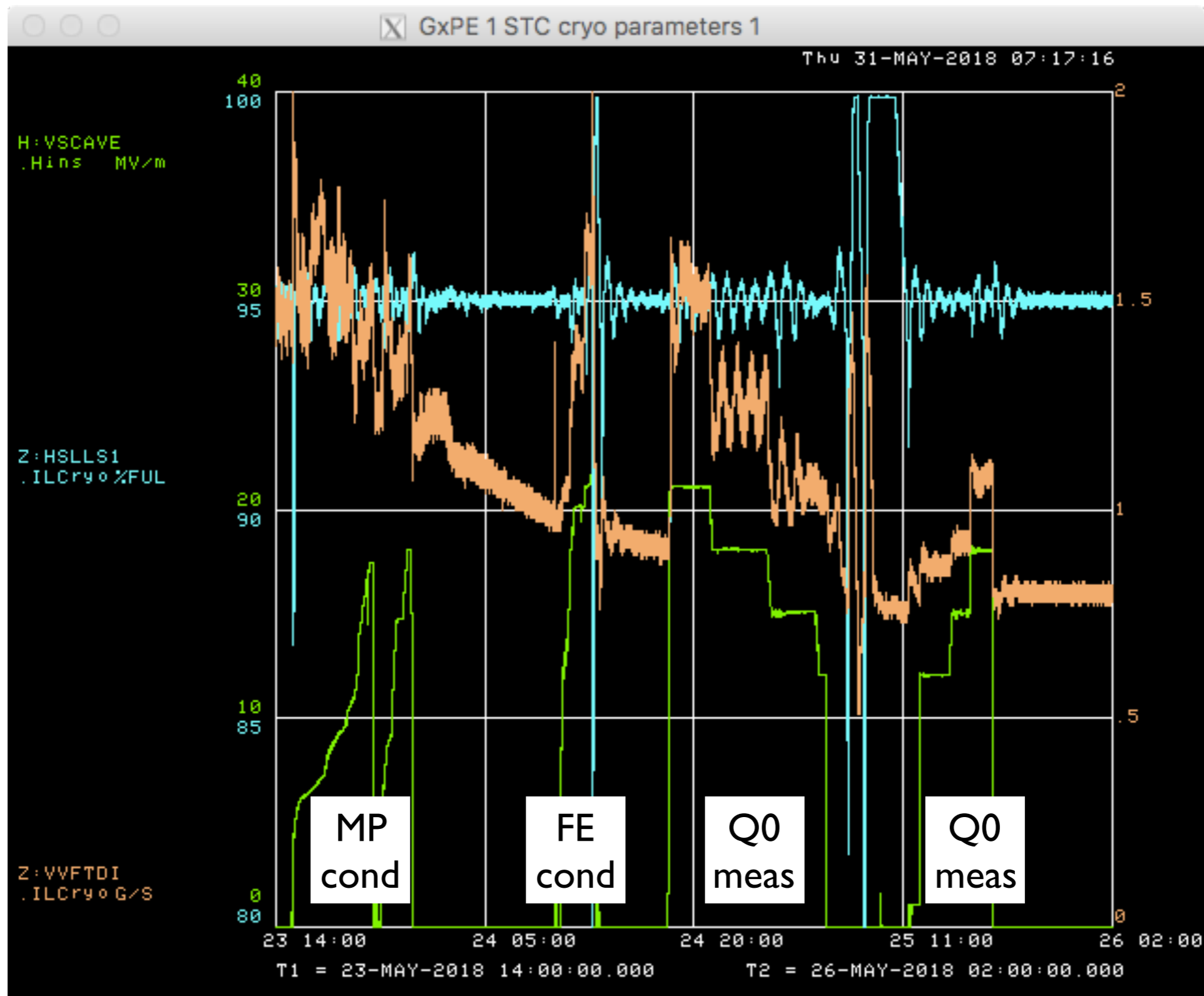
MP conditioning

- Were able to go through MP barriers after 5 hours of conditioning

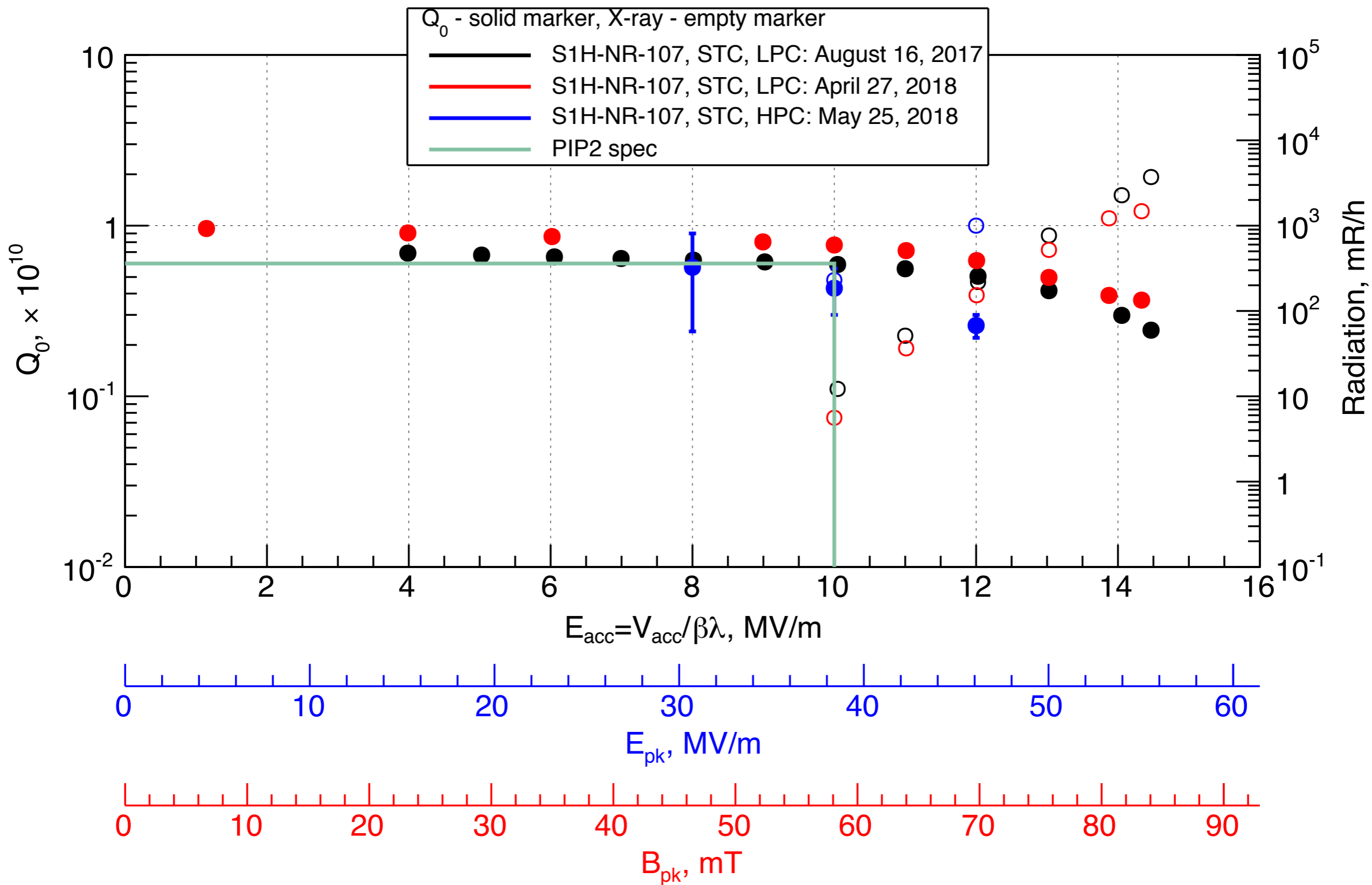


Cryogenic System

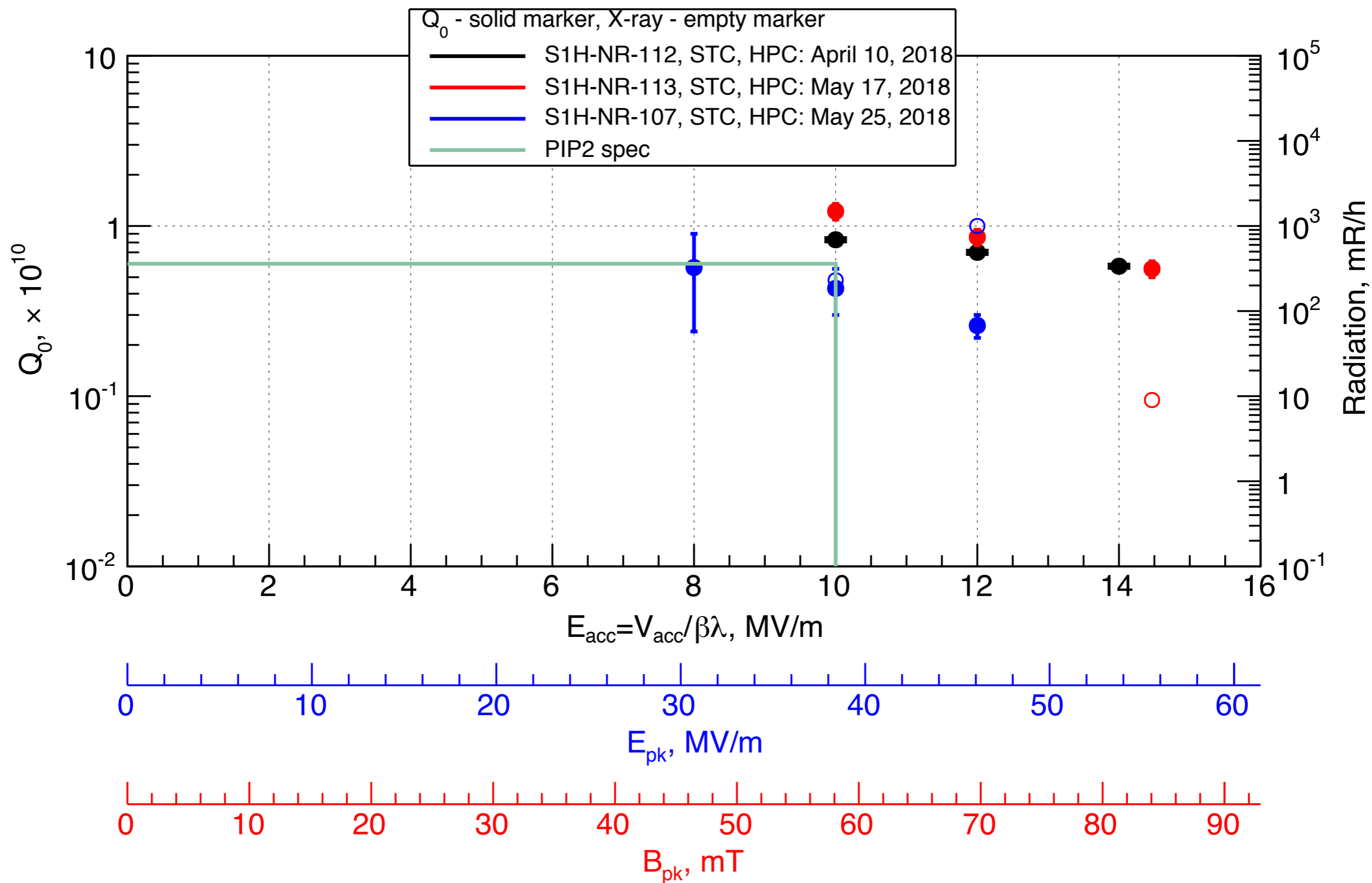
- LHe mass flow (orange), LHe liquid level (cyan), cavity field (green)



S-107 Summary Of STC Tests



Summary Of High Power Coupler Tests



Conclusion

- Pre-qualified SI07 in August 2017
- Confirmed pre-qualification in STC test in April 2018
- In HPC test FE radiation is higher, compared to LPC tests
 - ▶ Radiation onset at 9 MV/m
- Cavity may be operated radiation free at the beginning of the CM, at fields below 8 MV/m