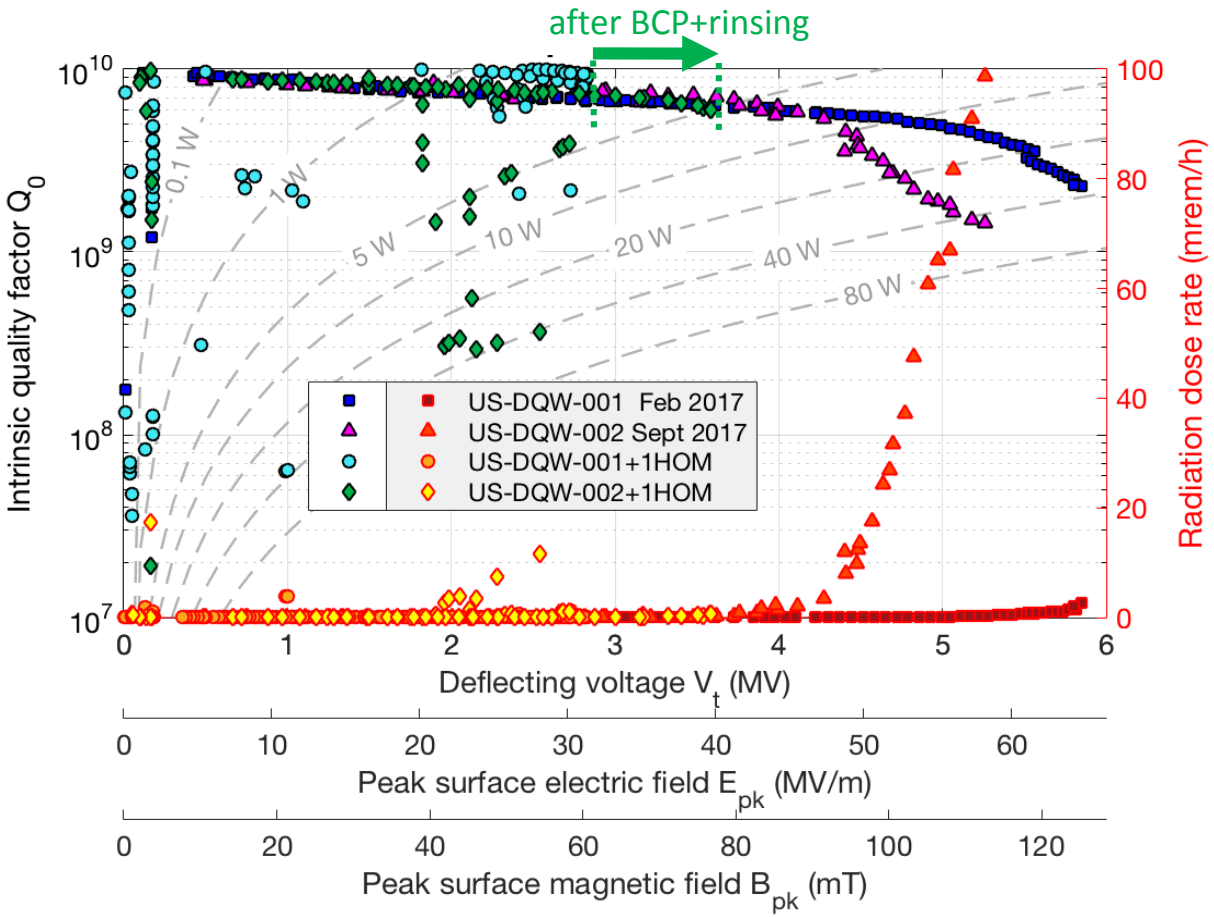
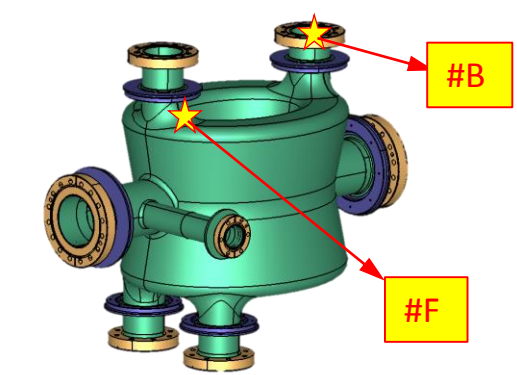
[10min] DQW cavity test results (summary)

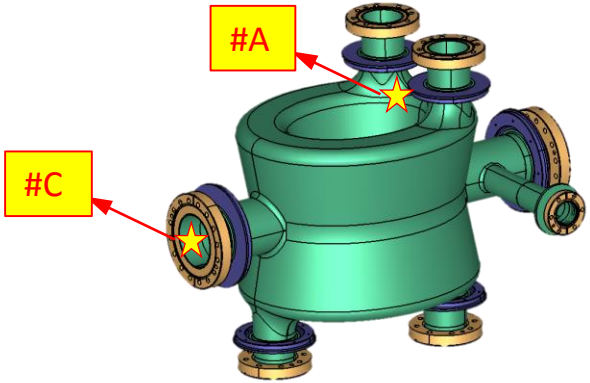
- **Same filter** tested with cavity #001 and #002. **Light BCP** in filter **between tests**: **from 2.8 to 3.6 MV**.
- Quench field level **lower than for bare cavity** tests.
- Sharp quench with **no significant radiation** increase.
- Quench field **higher in pulsed mode**.

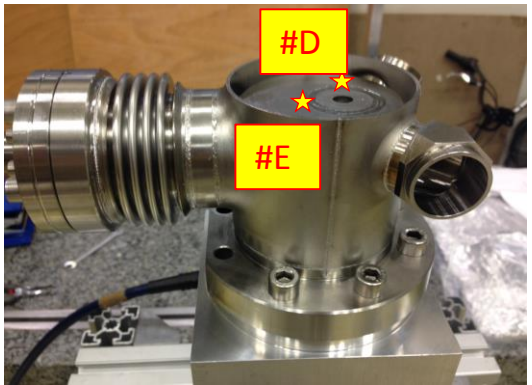


[10min] DQW cavity test results (summary)

Test US-DQWs		Surfaces	V_T (MV) [CW / pulsed]	V_{FE} (MV)	CERNOX signal
#1	(Feb)	Light BCP+HPR Flanges set #a	5.9 / 5.9	4.1	#A-5 (global max. B_{pk}) [#B-2 (FPC port flange) at 5.5 MV Q-switch event]
#2	(Jun)	Light BCP+HPR Flanges set #a			
#2	(Sep)	Light BCP+HPR Flanges set #a	5.3 / 5.3	2.8	#C-1 (input probe) #A-7 (global max. B_{pk})
#1+HOM	(May)	HOM filter rinsing Flanges set #b	2.8 / 3.4	n/a	#B-5 (FPC port flange) #D-7 (HOM filter) #E-8 (HOM filter)
#2+HOM	(Oct)	Light BPC+rinsing Flanges set #a	3.6 / 4.1	n/a	#F-4 (HOM port base) #D-7 (HOM filter) #E-8 (HOM filter)







[10min] DQW cavity test results (summary)

QUESTIONS

▪ Thermal or magnetic quench?	▪ Sharp, sudden quench, no evidence in Q-slope. ▪ Pulsed operation allows reaching higher quench level: an indication of thermal quench. Alternatively, test at a different temperature and compare quench levels.
▪ Field-emission related quench?	▪ No significant evidence of radiation. ▪ FE onset started at about 2.8 MV in cavity #002. ▪ Radiation monitor is on top of the Dewar. ▪ How do we explain thermosensor signals from #002+1HOM? ▪ No multipacting signature; only sharp, sudden quench.
▪ How to interpret CERNOX signals?	▪ Thermal path is interrupted. Mechanism in vacuum is shorting path: multipacting or field-emission plasma. ▪ Can we trust readout? … Increase redundance in next test.

[20min] Thermal simulations of HOM filter

(→ see Graeme Burt's slides)

[40min] Next simulations and test plans (for discussion)

PLANNED STUDIES

- **Thermal gradient** calculation in HOM filter for **niobium Rs > 10 nOhm**.
- **Energy deposition** on HOM filter **by FE current** electrons.
- Detailed **MP studies on HOM filter** region around **quench field level**.

NEXT TESTS (always using cavity #002)

- Is **improved cavity+HOM performance** from May to Oct **associated to 20um BCP**?
  TEST 1 → perform 50 um BCP + 120^{0}C bake to complete standard surface treatment
- Discriminate if quench in **cavity or filter**…
  TEST 2 → use spacer to lower Hpk in filter and check if cavity+HOM reach higher field level.
- Is **FE current responsible** for the quench?
  TEST 3 → electropolishing (reduced surface roughness) or pure coaxial cavity

INSTRUMENTATION

- Is **multipacting responsible** for the quench?
  INSTR 1 → transmitted RF signal through antenna: DC current (FE), frequency components (MP)
  INSTR 2 → high rep. rate acquisition of transmitted RF signal (resolve MP and FE signatures)
- INSTR 3 → Redundant thermosensor locations.

[20min] Other topics relevant to the DQW test program

1) Return HOM filter back to CERN

2) Expected delivery date of spacer to JLab

3) Instrumentation readiness at JLab