

Modular Cavity Schedule

Yağmur Torun



Illinois Institute of Technology/Fermilab



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Summary (preliminary)

Inspection between rows.

Run	Date	Plates	B	pulses	MV/m
1	Apr 2015	Cu	0	1.75M	30
	Aug-Sep 2015	Cu	0		?
	Sep-Oct 2015	Cu	0		45?
2	Dec 2015	Cu	3T	5M	<12
3	Feb 2016	Cu	0	14M	22
4	Apr 2016	Cu	3T	3M	~10
5	Jan-Feb 2017	Be	0	11M	37?
6	Apr 2017	Be	3T	>10M	46*
7	May 2017	Be	0		

* limited by breakdown upstream of the cavity



1) Questions/Goals

- ① Why is performance with Be endplates so much better in $B=3T$ compared to $B=0$? (very little dark current, minimal sparking on the way to record gradient, breakdown rate low and still improving there)
 - a) it isn't (didn't take enough time to condition surface at $B=0$, etc.)
 - can (intend to) check by running at $B=0$ again
 - b) B-field helps suppress breakdown somehow (magnetic insulation near coupler, etc.)
 - hard to see how
 - check by running at $B=0$ and other values
- ② Is there something magical about 3T?
 - unlikely
 - can check by varying B



1) Questions/Goals

- ③ What else can we do in this run before disassembling the cavity for inspection?
 - a) Instrumentation studies
 - Faraday cup front end
 - dark current imaging
 - b) push higher
 - SF6 in waveguide
 - or higher air pressure
 - spark count at 37? (+160?)
 - risk of damage if problem is in the coupler/skinny waveguide
 - overall risk higher at high power (stress in Be)
 - leave well enough alone? what do we gain by finding upper "limit"
 - c) vary B (without sparking)
 - could still have changes in surface



1) Questions/Goals

- ④ What else should we do after this run?
 - a) Be-Be at $B=0$
 - b) Cu-Be at $B=3T$
 - c) Cu-Be at $B=0$
 - d) Cu-Be at varying B
 - e) Be-Be varying other parameters (pulse length, etc.)



2) Logistics

- 1 Can we afford to run much longer?
 - a) supposed to turn off cryo after present run and RF in a few weeks after one more run
 - b) need to make case to AD management for anything beyond
 - c) no priority for tech support, maintenance in any case
 - d) no critical mass for 24x7 shift coverage
 - remote monitoring possible but need physical access to reset after modulator trips (avg 1/shift)
 - e) other important tasks (MICE shifts, etc.)
 - f) most of us should have moved on long time ago
 - g) heavy load leads to increased risk
 - h) but this seems important



2) Logistics

- ② Horizon is short
 - a) conflict with other activity in the hall before shutdown
 - beamline cleanup
 - mu2e beam diagnostics test
 - b) very difficult to run during shutdown (Jul-Oct)
 - especially cryo plant
 - scheduled/random outages
 - likely no tech support
 - c) FY17 funding end Sep
 - need more cleanup in the hall (and elsewhere) by then
 - should leave everything in good/safe state
- ③ No guarantees: The entire test station is a hot spare for the Linac, any failure at other stations can interrupt/end our program



3) Plan?

- 1 How long is a run?
 - a) 2-3 weeks (could be shortened to 1-2)
 - b) plus 2-week turn-around for inspection
 - assuming tech support when needed
 - c) obviously, more can be done if we give up inspection
 - d) quicker transition possible between Be-Be and Cu-Be
- 2 How many runs can we squeeze in by the shutdown
 - a) 1 is feasible and part of our plan (B=0, Be endplates)
 - was supposed to be the last one
 - b) 2 would be possible but very difficult
 - inspection during the shutdown
 - c) 3 is unreasonable
- 3 Should submit a request to AD management asap for continued access to RF and cryo until the shutdown