

Cavity Test Plan in S1-Global Cryomodule

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1st cool-down starts in 7th, June

1. Low Power RF Tests (3, +1 weeks)

- . Fundamental RF parameters
- . Tuner performance

at room temperature,

2. Conditioning of Couplers (2 weeks)

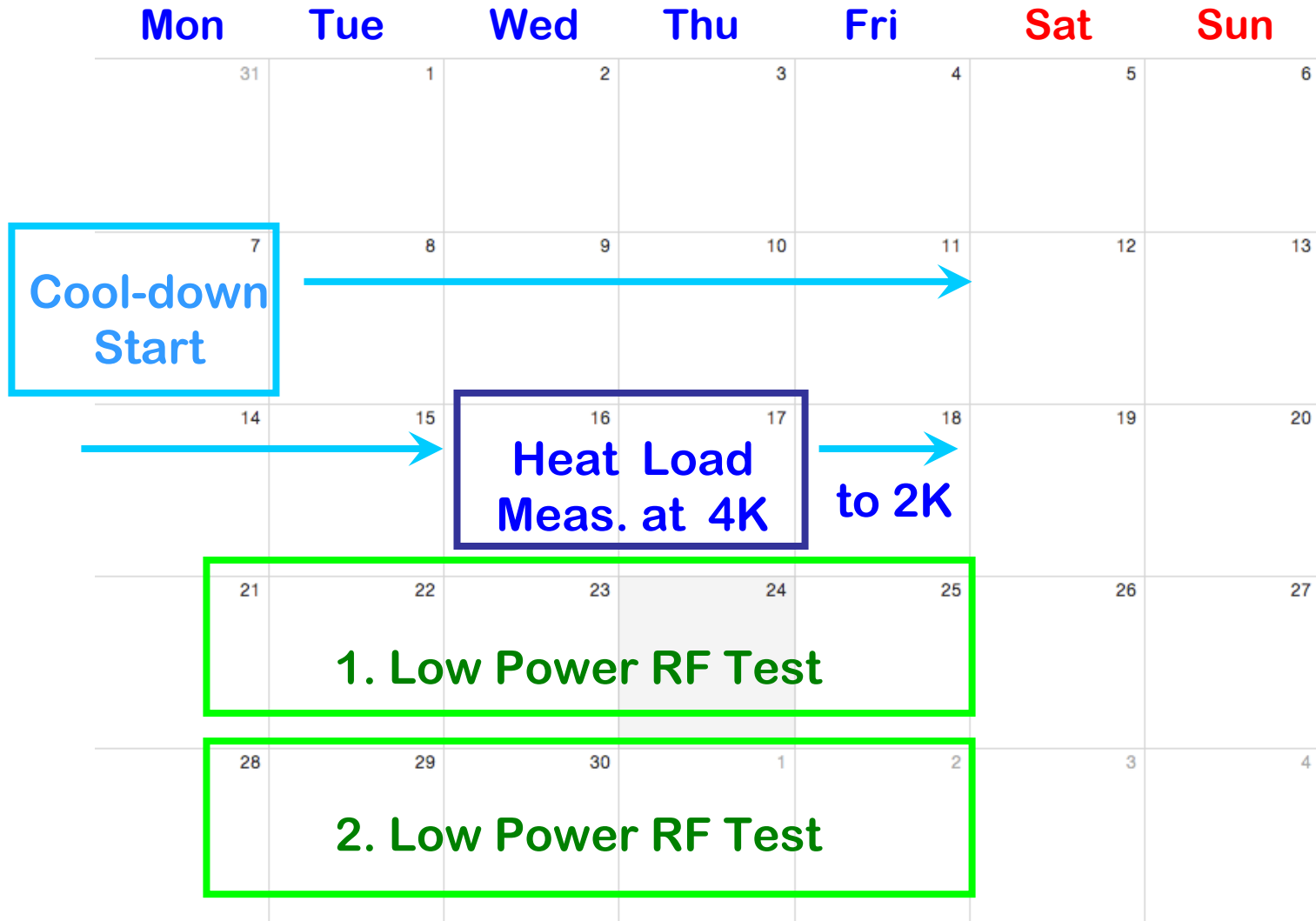
2nd cool-down starts in 6th, September

3. High Power RF Tests (2, 2, 4 weeks)

- . Cavity high gradient performance
- . Observation and compensation of L. Detuning
- . Dynamic loss measurement



June, 2010





July, 2010

Mon	Tue	Wed	Thu	Fri	Sat	Sun	
28	29	30	1	2	3	4	
5	3. Low Power RF Test INFN (Carlo Pagani) / FNAL				9	10	11
12	Heat Load Meas. at 2K		Calib. Meas. at 2K by Heater		17	18	
19	4. Low Power RF Test (spare) (or INFN / FNAL)				24	25	
26	27	28	29	30	31	1	

Holiday

→
Warm up

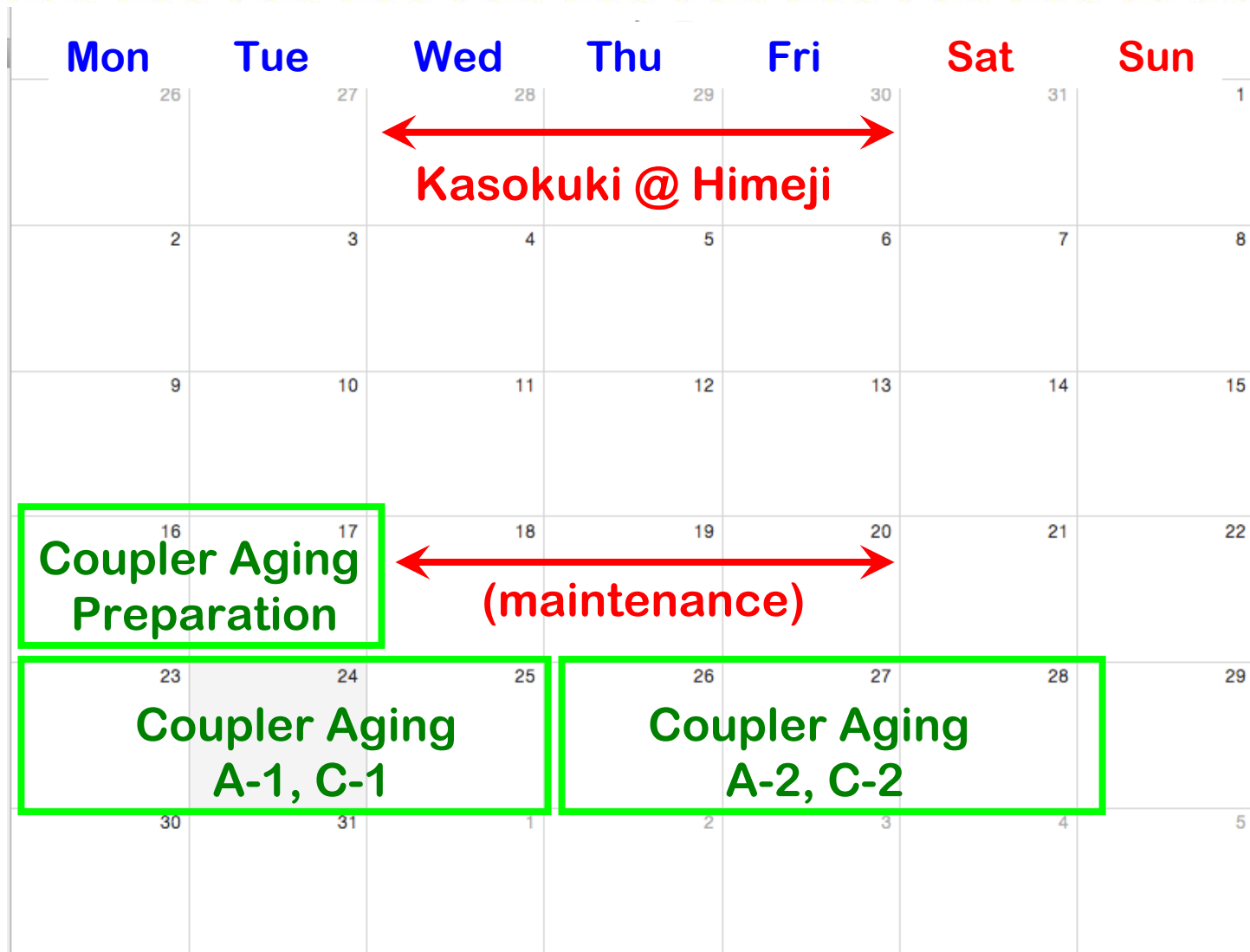


Plan of Low Power RF Tests

Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	RF Source
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	RF Source
Low Power Test (1)	22 (Tue)	23 (Wed)	24 (Thu)	25 (Fri)	
Tuner Stroke & Hysteresis	2.0 h	2.0 h	2.0 h	2.0 h	Network Analyzer
Variable Input QL	1.0 h	1.0 h	1.0 h	1.0 h	Network Analyzer
Monitor Qt, HOM Qext	1.0 h	1.0 h	1.0 h	1.0 h	Network Analyzer
Piezo Stroke & Hysteresis	2.0 h	2.0 h	2.0 h	2.0 h	Network Analyzer
Piezo Reproducibility	1.0 h	1.0 h	1.0 h	1.0 h	Network Analyzer
Low Power Test (2)	29 (Tue)	30 (Wed)	01 (Thu)	02 (Fri)	
Input QL, Qt Calibration	1.0 h	1.0 h	1.0 h	1.0 h	50W RF Amp.
Piezo; Single Pulse Response	4.0 h	4.0 h	4.0 h	4.0 h	50W RF Amp.
Mechanical Vibration Mode	2.0 h	2.0 h	2.0 h	2.0 h	50W RF Amp.
Low Power Test (3)	05 (Tue)	06 (Wed)	07 (Thu)	08 (Fri)	
Piezo; Double Pulse Response	3.0 h	3.0 h	3.0 h	3.0 h	50W RF Amp.
Piezo; Multi Pulse Response	4.0 h	4.0 h	4.0 h	4.0 h	50W RF Amp.
Cryomodule-C; Carlo Pagani and INFN/FNAL Colleagues					



August, 2010





Conditioning of Input Couplers

Cryomodule-C; #1 Klystron (2 MW)

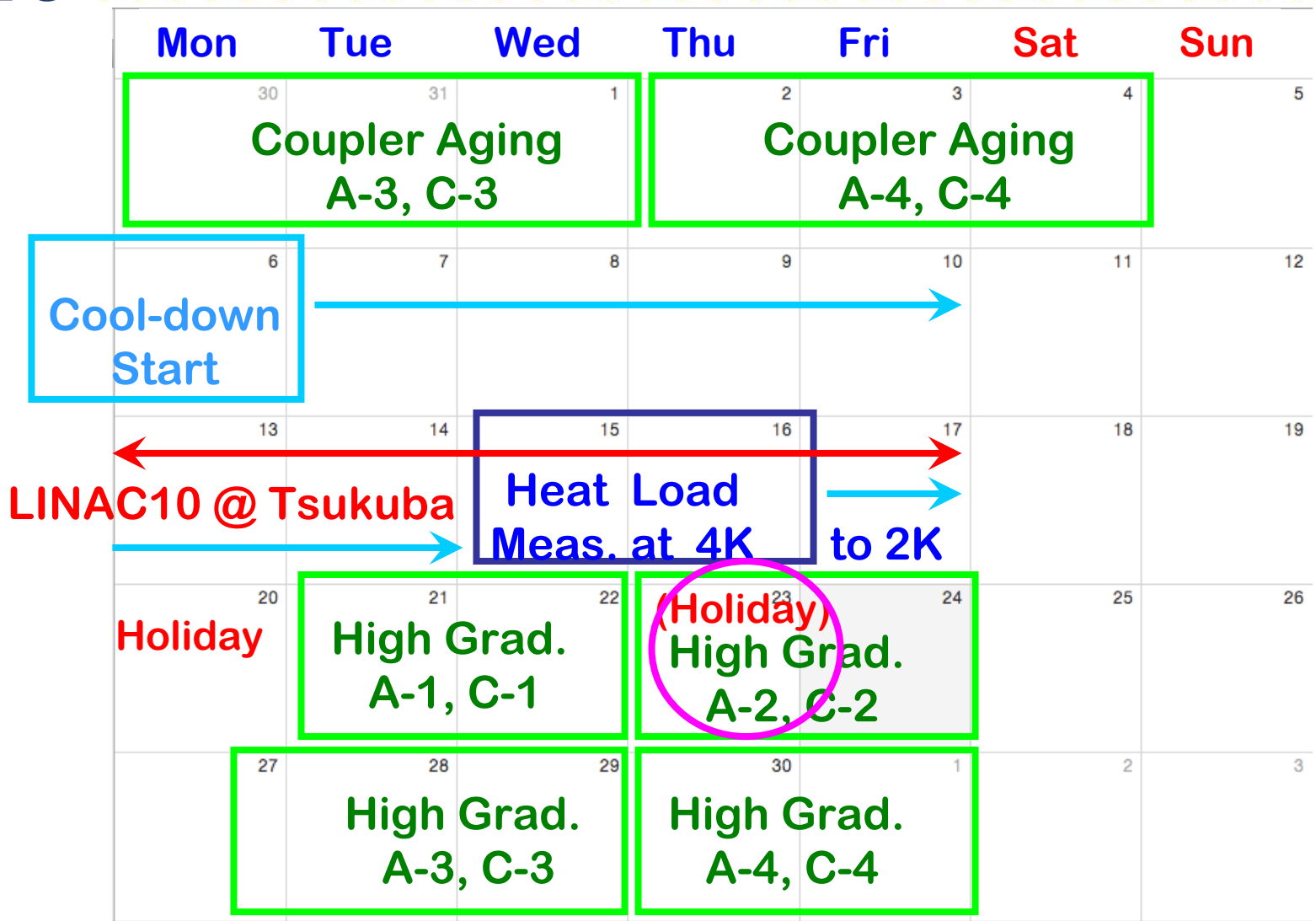
Cryomodule-A; #2 Klystron (5 MW)

- one coupler individually (one by one)
for 3 days per one coupler
- 20 μs , 50 μs , 100 μs , 200 μs , 400 μs , 500 μs
Pin = 500 kW, 5 Hz
- 800 μs , 1.0 ms, 1.5 ms
Pin = 300 kW, 5 Hz

**Participation from DESY, SLAC, FNAL
is absolutely necessary.**



September, 2010





High Power RF Test (1)

Processing of Cavities

Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	RF Source
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	RF Source
High Power Test (1)	21 (Tue)	23 (Thu)	28 (Tue)	30 (Thu)	
Input QL, Qt Calibration	1.0 h	1.0 h	1.0 h	1.0 h	Klystron
Cavity Processing (0.6 ms)	4.0 h	4.0 h	4.0 h	4.0 h	Klystron
Cavity Processing (1.5 ms)	2.0 h	2.0 h	2.0 h	2.0 h	Klystron
	22 (Wed)	24 (Fri)	29 (Wed)	01 (Fri)	
Cavity Processing (1.5 ms)	3.0 h	3.0 h	3.0 h	3.0 h	Klystron
Observation of Lorentz Detuning	4.0 h	4.0 h	4.0 h	4.0 h	Klystron

Many interesting experiments are planned.
S1-Global is really an international work.



October, 2010

Mon	Tue	Wed	Thu	Fri	Sat	Sun
27	28	29	30	1	2	3
4	5	6	7	8	9	10
	Lorentz D. A-1, C-1		Lorentz D. A-2, C-2			
11	12	13	14	15	16	17
Holiday	Lorentz D. A-3, C-3		Lorentz D. A-4, C-4			
18	19	20	21	22	23	24
	Dynamic Loss C-1	Dynamic Loss C-2	Meas. C-3	C-4	FNAL (T. Peterson)	
25	26	27	28	29	30	31
	Dynamic Loss A-1	Dynamic Loss A-2	Meas. A-3	A-4		



High Power RF Test (2)

Compensation of Lorentz Detuning

Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	RF Source
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	RF Source
High Power Test (2)	05 (Tue)	07 (Thu)	12 (Tue)	14 (Thu)	
Optimization of offset Detuning	2.0 h	2.0 h	2.0 h	2.0 h	Klystron
RF feedback on/off control	2.0 h	2.0 h	2.0 h	2.0 h	Klystron
Compensation of Lorentz Detuning	3.0 h	3.0 h	3.0 h	3.0 h	Klystron
High Power Test (3)	06 (Wed)	08 (Fri)	13 (Wed)	15 (Fri)	
Optimization of Compensation of L.D.	7.0 h	7.0 h	7.0 h	7.0 h	Klystron



High Power RF Test (3)

Measurement of Dynamic RF Loss

Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	RF Source
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	RF Source
High Power Test (4)	19 (Tue)	20 (Wed)	21 (Thu)	22 (Fri)	
Dynamic Loss of One Cavity (Module-C)	7.0 h	7.0 h	7.0 h	7.0 h	Klystron
Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	Klystron
	26 (Tue)	27 (Wed)	28 (Thu)	29 (Fri)	
Dynamic Loss of One Cavity (Module-A)	7.0 h	7.0 h	7.0 h	7.0 h	Klystron
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	Klystron
		04 (Thu)			
Dynamic Loss of Four Cavity	7.0 h				
Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	Klystron
		05 (Fri)			
Dynamic Loss of Four Cavity	7.0 h				
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	Klystron
			11 (Thu)	12 (Fri)	
Dynamic Loss of Eight Cavity	7.0 h	7.0 h			
Cryomodule-C	A (AES004)	B (ACC011)	C (Z108)	D (Z109)	Klystron
Cryomodule-A	E (MHI-05)	F (MHI-06)	C (MHI-07)	D (MHI-09)	Klystron



November, 2010

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1 4 Cavity Control	2 (Holiday)	3 Dynamic Loss A 4 cav.	4 Dynamic Loss C 4 cav.	5 6	7
8	9 8 Cavity Control	10	11 Dynamic Loss 8 cav.	12 Dynamic Loss 8 cav.	13	14
15	16 LLRF	17	18	19	20	21
22 (Holiday)	23 Heat Load at 2K	24	25 Calibration by Heater	26	27	28
DRFS Preparation						
29	30 DRFS	1	2	3	4	5



December, 2010

Mon	Tue	Wed	Thu	Fri	Sat	Sun
29	30	1	2	3	4	5
6	7	8	9	10	11	12
DRFS						
13	14	15	16	17	18	19
DRFS						
20	21	22	23	24	25	26
DRFS			Holiday			
			Warm up			
27	28	29	30	31	1	2