









LLRF Resonance Control System for LCLS2 Cavities Rama Bachimanchi¹, Garth Brown⁴, Brian Chase², Larry Doolittle³, Joshua Einstein-Curtis², Curt Hovater¹, Gang Huang³, George Lahti¹ and Dave Seidman¹ 1. Jefferson Lab, 12000 Jefferson Avenue, Newport News, VA 23606, USA 2.Fermilab, Pine St, Batavia, IL 60510, USA 3.Berkeley Lab, 1 Cyclotron Road, Berkeley, CA 94720, USA 4. SLAC, 2575 Sand Hill Rd, Menlo Park, CA 94025, USA

Abstract

LCLS2 cryomodules have slow and fast tuners for maintaining the resonance on a cavity. Piezo is an electro mechanical tuner, which acts as the slow tuner and is mainly used for keeping the piezo's range and also for tuning the cavities outside of the resonance control system, firmware and EPICS associated with it and the

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		Load Capacitance	Signal Bandwidth		Load (uF)	V 50 V	oltage Ran 100 V	ge 15
ver		No Load	180 kHz		0.01	64000	32000	210
		10 nF	105 kHz		0.03	21000	11000	71
		30 nF	40 kHz		0.1	6400	3200	21
		100 nF	11 kHz		0.3	2100	1100	71
		300 NF	3.8 KHZ		1	640	320	21
		3 uF	320 Hz		3	210	110	7
		10 uF	62 Hz		10	64	32	2
		30 uF	24 Hz		30	21	11	-
	Та	ble 2. Small signal	bandwidth (-3 d	B) Tab	le 1. Power	bandwidth (in Hz) with a	a capa



Fermilab CMTS

- Piezo range tests
- GDR using manual control of piezos
- Active compensation algorithm development in progress

JLAB CMTF

- Tested the range of the piezos
- 2200 Hz for ±48 V
- Verified the stepper controller operation
- Both limit switches
- Tuned the cavity in SEL using the stepper before engaging piezo

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