

LCLS-II Fermilab's Contribution to Next Generation CW Light Source

FERMILAB-POSTER-20-003-TD

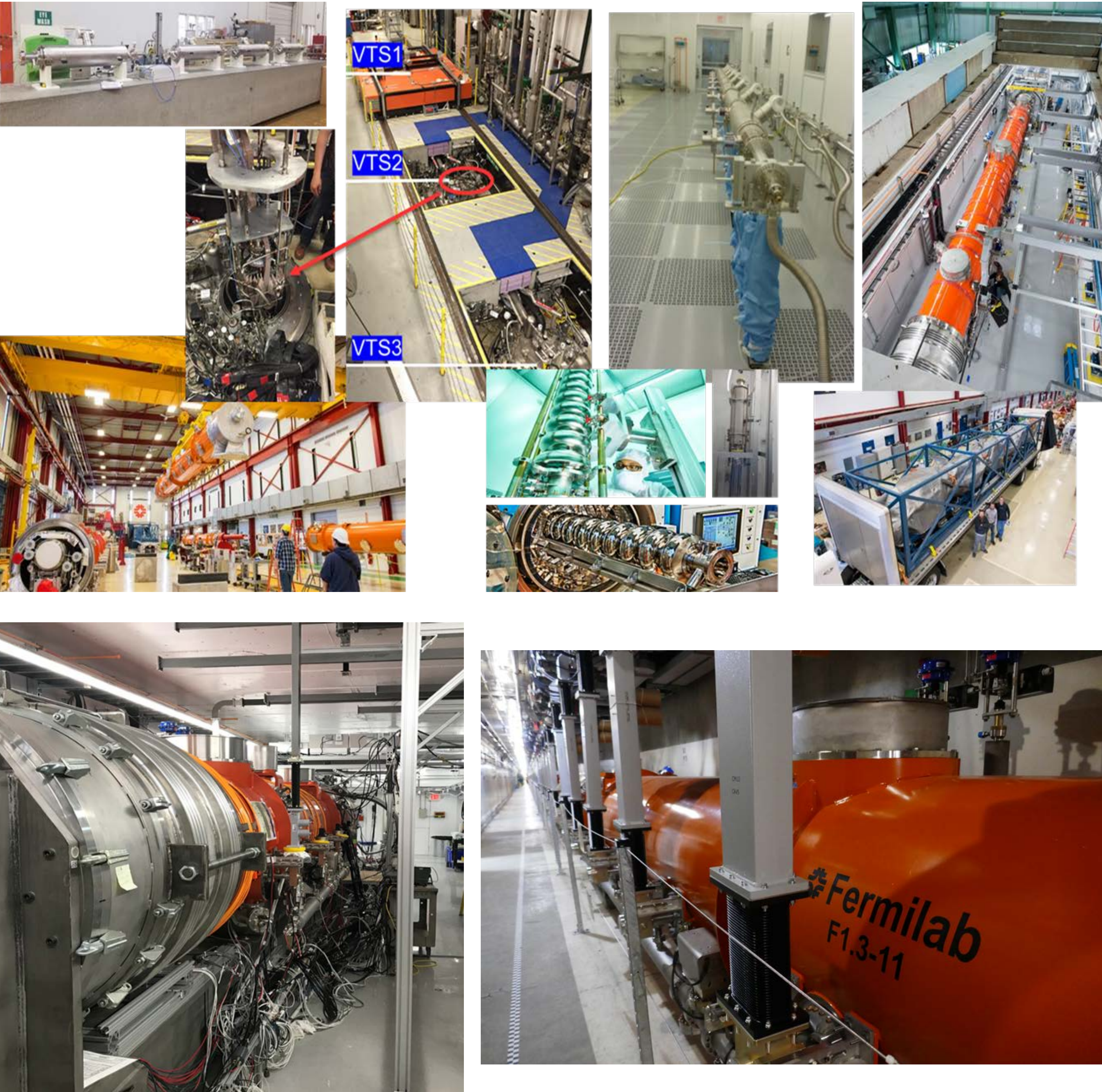
Richard Stanek, Fermilab

LCLS-II

- Significant advancement to the operational LCLS Facility
- 4 GeV CW superconducting linac
 - Requires thirty-five 1.3 GHz CM + two 3.9 GHz CM
- Collaboration of SLAC, LBNL, ANL, JLab, Cornell, and Fermilab
- Fermilab's scope includes
 - Design both the 1.3 GHz and 3.9 GHz cryomodules (CM)
 - Assemble/test seventeen 1.3 GHz CM and three 3.9 GHz CM
 - Procure components for Cryogenic Distribution System

Benefits

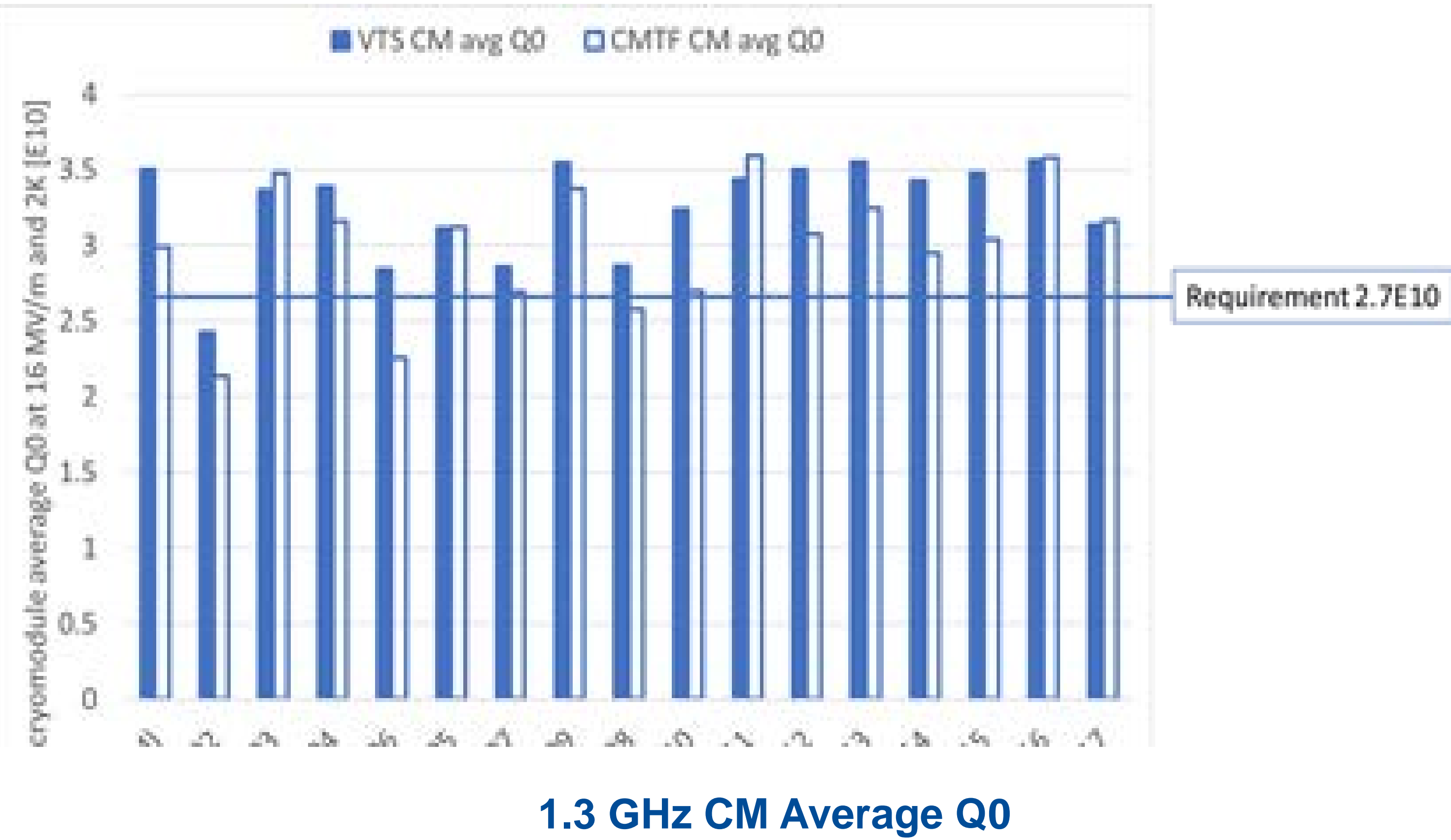
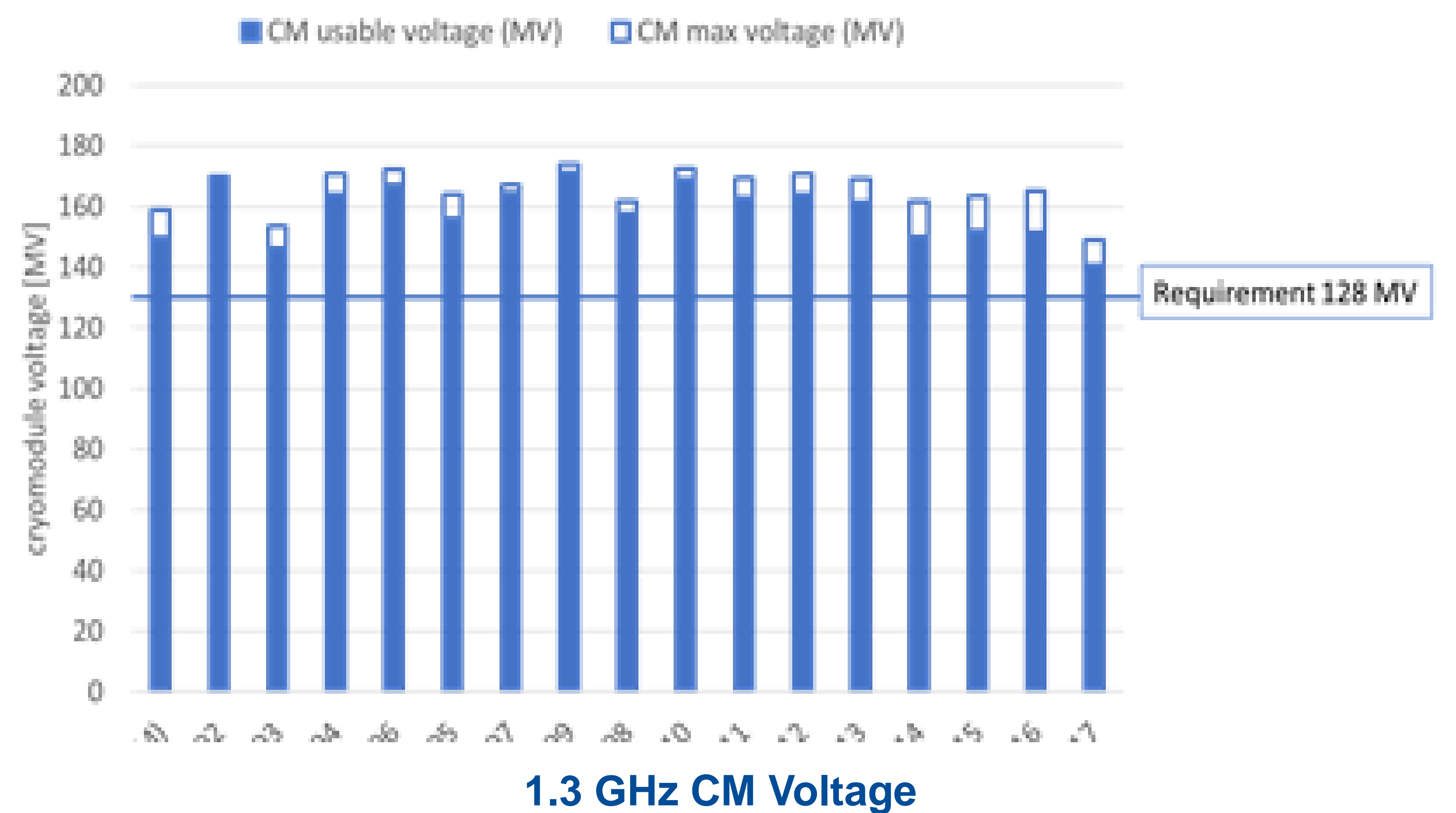
- Utilizes existing expertise and infrastructure in DOE lab system
- Most cost effective and quickest way to build the machine
- Pushes the state of the art in SRF technology
- Enhances Fermilab SRF capabilities
 - R&D for cavity processing
 - Large scale production of SRF modules
- Serves as a model for collaboration between national labs



This document was prepared by the LCLS-II Collaboration using the resources of the Fermi National Accelerator Laboratory (Fermilab), a U.S. Department of Energy, Office of Science, HEP User Facility. Fermilab is managed by Fermi Research Alliance, LLC (FRA), acting under Contract No. DE-AC02-07CH11359.

Performance Exceeds Specification

- Voltage/CM = 158 MV (spec 128 MV)
- Average Q0 = 3 E10 (spec 2.7 E10)



Cryomodule	VTS		CMTF Test				
	Eacc* [MV/CM]	Q0@16MV/m	Max** Voltage [MV]	Usable*** Voltage [MV]	Q0 @ 16MV/m	Cavities not meeting FE onset spec (14 MV/m)	Cavities with FE limiting the usable gradient to <16 MV/m
F1.3-01	n/a	n/a	153	150	3.00E+10	#5, #7	none
F1.3-02	195	2.40E+10	170	170	2.10E+10	#5	none
F1.3-03(a)	202	3.48E+10	158	144	3.30E+10	#5	#5
F1.3-04	170	3.40E+10	171	164	3.10E+10	#3, #6	#3
F1.3-06	181	2.80E+10	172	167	2.03E+10	#2	none
F1.3-05 ¹	222	3.10E+10	164	156	3.10E+10	#2	none
F1.3-07	192	2.80E+10	167	165	2.60E+10	none	none
F1.3-09	202	3.50E+10	174	171	3.30E+10	#5, #6	none
F1.3-08	197	2.80E+10	162	158	2.50E+10	none	none
F1.3-10	198	3.20E+10	173	168	2.70E+10	#2	none
F1.3-11	203	3.50E+10	171	163	3.60E+10	none	none
F1.3-12 ¹	207	3.49E+10	171	164	3.10E+10	none	none
F1.3-13	210	3.50E+10	169	162	3.27E+10	none	none
F1.3-14	190	3.40E+10	162	150	3.10E+10	none	none
F1.3-15	202	3.40E+10	163	152	3.04E+10	none	none
F1.3-16	194	3.57E+10	165	152	3.58E+10	none	none
F1.3-17	175	3.13E+10	149	141	3.16E+10	#8	#8
F1.3-18	205	3.26E+10	172	159	3.48E+10	none	none
F1.3-19	174	3.61E+10	155	149	3.59E+10	none	none
Average	195	3.24E+10	165	158	3.03E+10		
	*no VTS admin limit		**21MV/m limit	***50mR/hr rad limit			

World Class Results in a Record Time

Title of Poster – Helvetica / Arial Bold 110pt

Author(s) of poster, Affiliation – Helvetica / Arial 60pt Regular

Subtitles – Helvetica / Arial Bold 50pt RGB 0,76,151

Body text – Helvetica / Arial Regular 40pt / Black
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