

LCLS-II Project Update

6th POCPA Workshop

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9/24/2018



- LCLS-II Project Overview
- LCLS-I and LCLS-II Baseline
- LCLS-II High Energy (HE) Upgrade
- LCLS-I and LCLS-II Beam Switch Yard
- LCLS-II Project Status
- LCLS-II Integration

LCLS-II Power Supply Reference (5th POCPA Workshop):

<https://indico.cells.es/indico/event/52/session/11/contribution/18/material/slides/0.pptx>

LCLS-II Project Overview

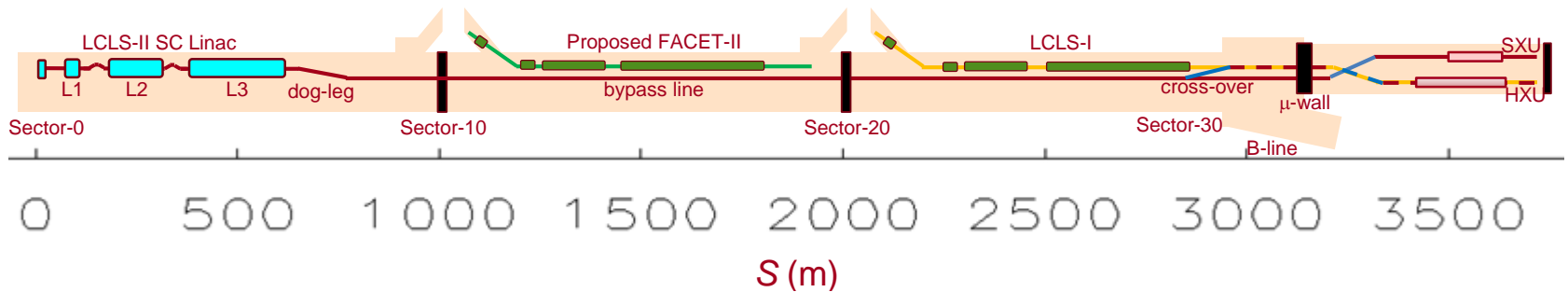
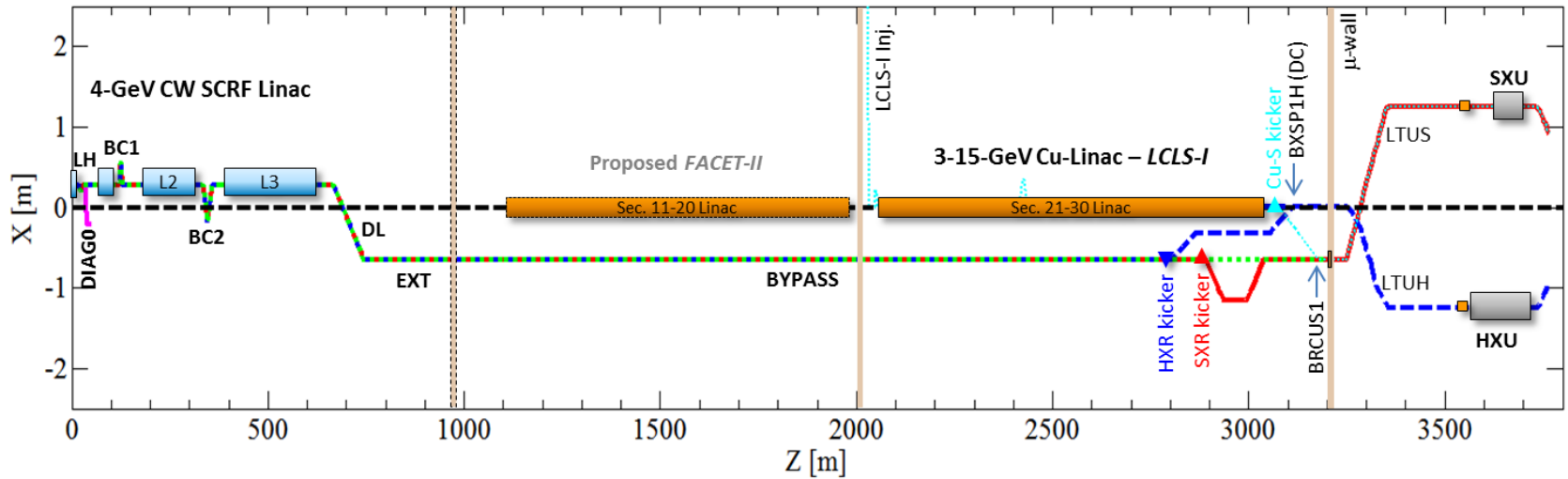


Table 1. Electron beam parameters from the SCRF linac in the LCLS-II.

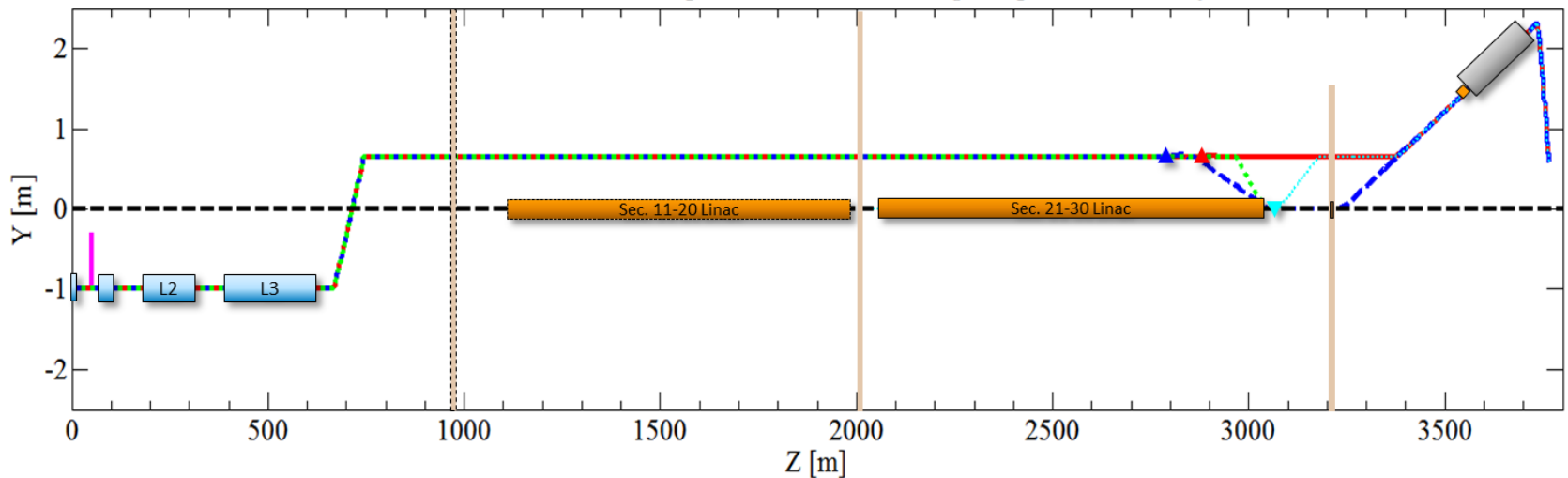
Electron Beam Parameters	symbol	nominal	range	units
Final electron energy (operational)	E_f	4.0	2.0 - 4.50	GeV
Maximum upgrade energy (or reduced duty factor)	E_{max}	10	-	GeV
Electron bunch charge (limited by beam power)	Q_b	0.10	0.01 - 0.30	nC
Bunch repetition rate in linac (CW)	f_b	0.620	0 - 0.929	MHz
Average electron beam power at linac end (limit)	P_{av}	0.25	0-1.2	MW
Normal rms transverse slice emittance (nom. charge)	$\gamma\epsilon_{L-s}$	0.45	0.2 - 0.7	μm
Final peak current	I_{pk}	1000	500 - 1500	A
Final rms bunch length	σ_z	8.3	0.6-52	μm
Final slice energy spread (rms)	σ_{Es}	500	125-1500	keV

LCLS-I and LCLS-II Baseline

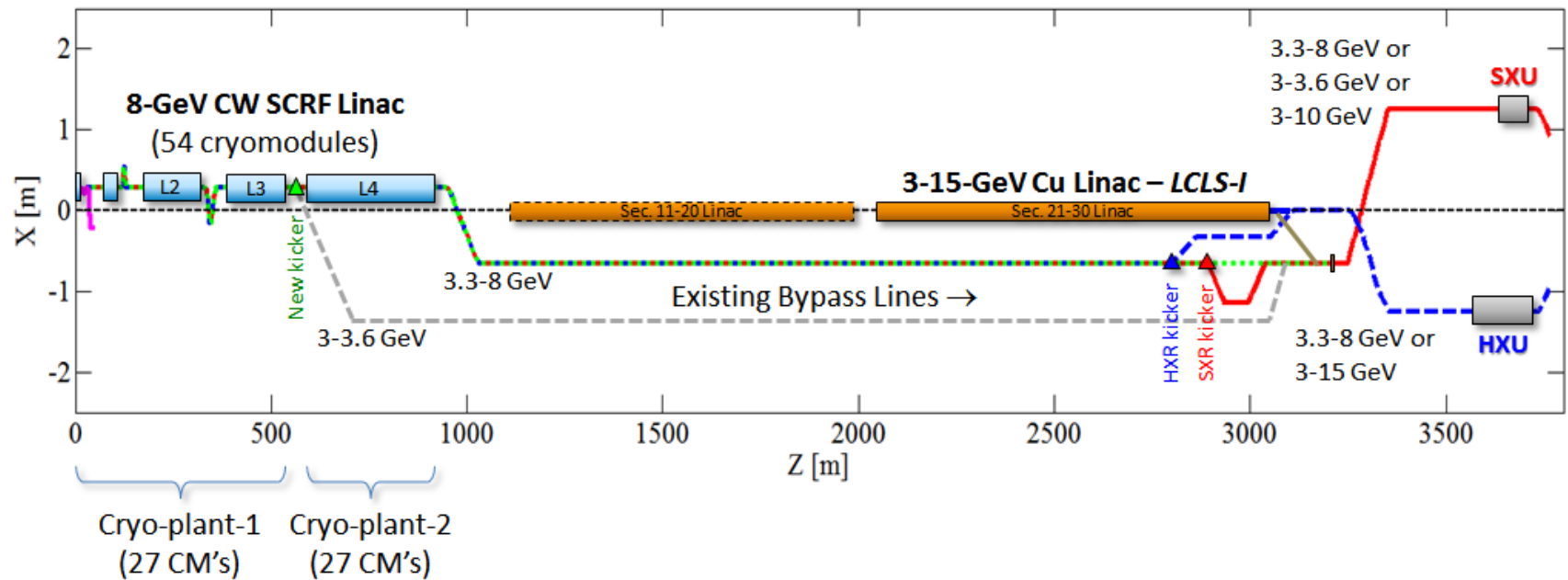
LCLS2sc (November 28, 2016)



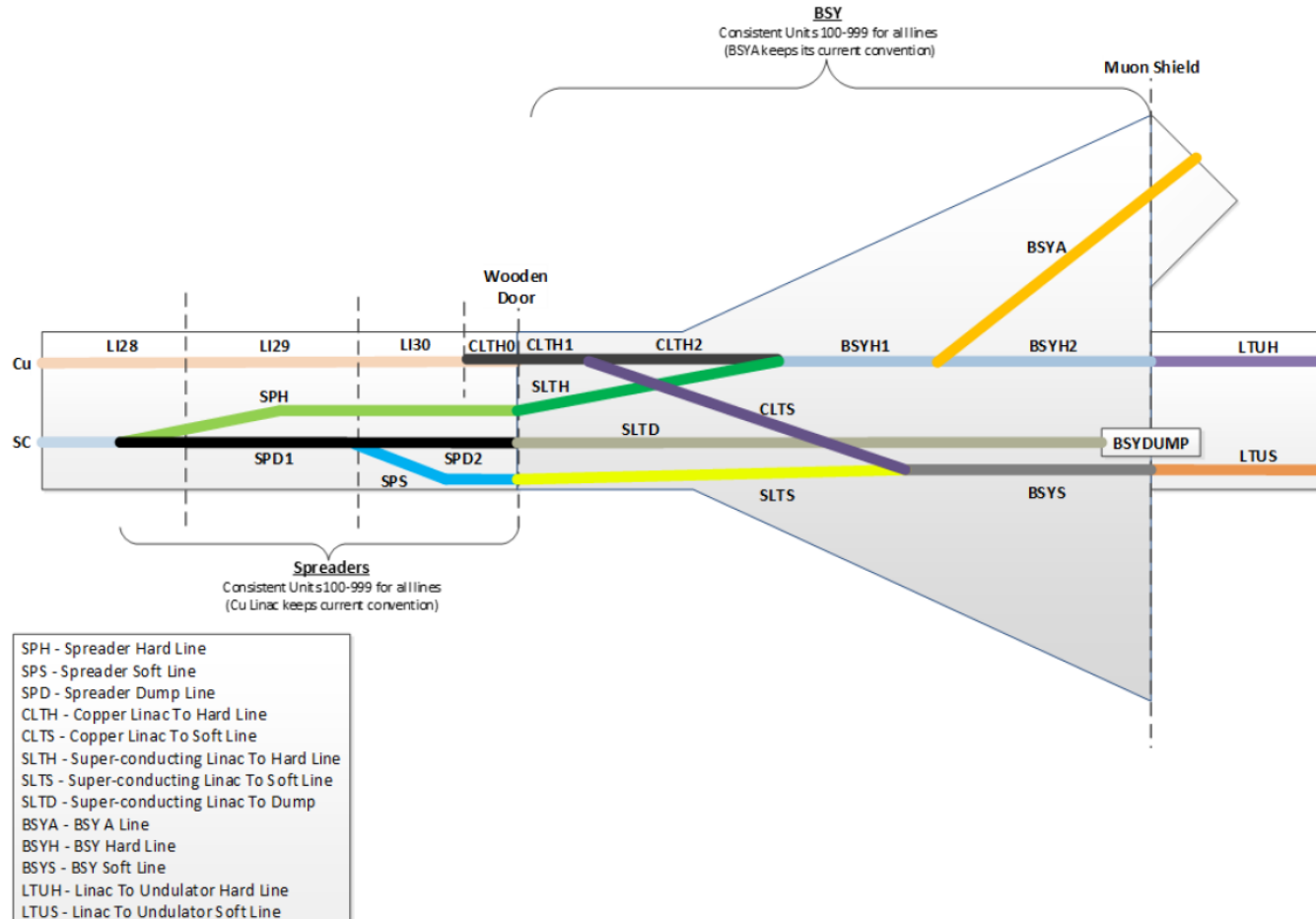
blue-dash=HXR, red-solid=SXR, green-dot=BSY-Dump, magenta=DIAGO, cyan=Cu-SXR



LCLS-II HE Upgrade (CD-1)



LCLS-I and LCLS-II Beam Switch Yard



LCLS-II Project Status

- Present status:
 - Injector installation is complete and is undergoing commissioning
 - Cryoplant, Facilities and electronics (PS, Controls, RF, etc.) installation is ongoing
- Power supply systems
 - All equipment is received and is being loaded into racks on site
 - 90% complete with loading racks, including internal wiring
 - 91 racks
 - 200 intermediate (1.5-15kW) power supplies
 - 589 corrector (and small quads) (1-30A) power supplies
- Shutdown begins December 20th, 2018 for ~one year of installation
 - All beamline components must be installed and checked out
 - Cryomodules are currently on the critical path
 - User operation resumes March 5th, 2020

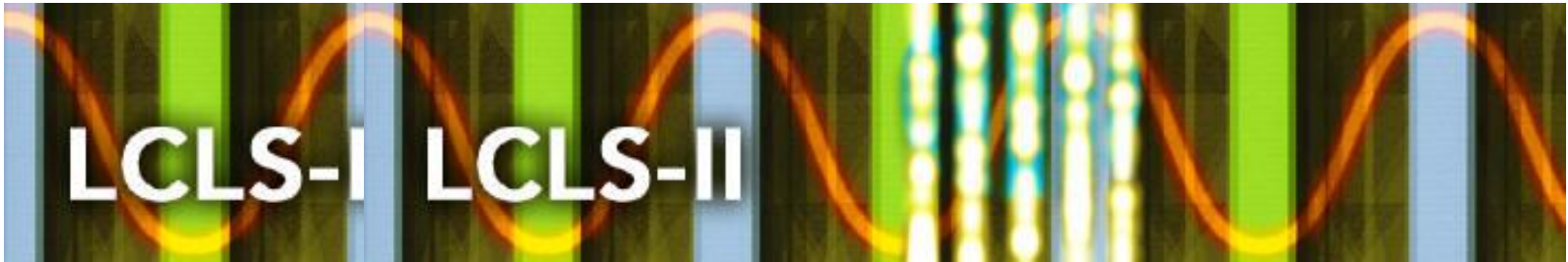
LCLS-II Racks



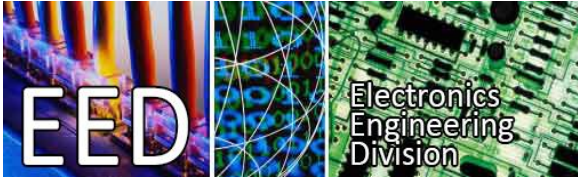
- Facilities
 - Remain diligent to review facilities and infrastructure design to make sure layout drawings and requirements are met
 - Advanced facilities schedule led to incorrect installation requiring rework
- Personnel Protection Systems
 - Clearly define protection logic and interface in design reviews
 - Redundant interlocks with logic to allow testing of individual permit signals and individual status read backs.
 - Minimize/eliminate rework of logic after installation
- Beam Containment Systems and Machine Protection Systems
 - Ensure requirements are clearly defined early for integration of magnet current monitors (DCCTs, zero-flux and/or hall effect) and power supply status for BCS and MPS
 - MPS is using zero-flux DCCTs, interfacing to fast analog DAQ for BPMs
 - BCS is still down selecting, interfacing to PLC 4-20mA input

LCLS-II Racks Installed





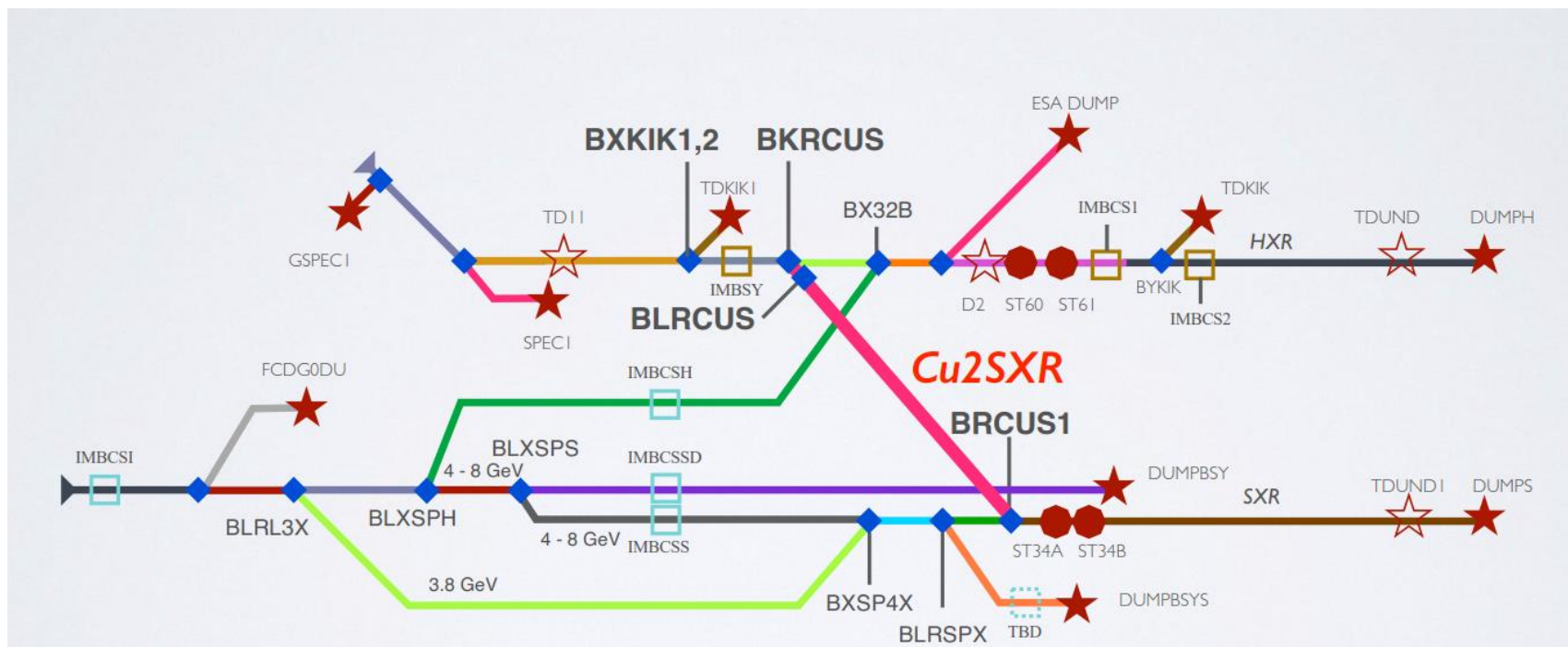
End











LCLS-II-HE

