

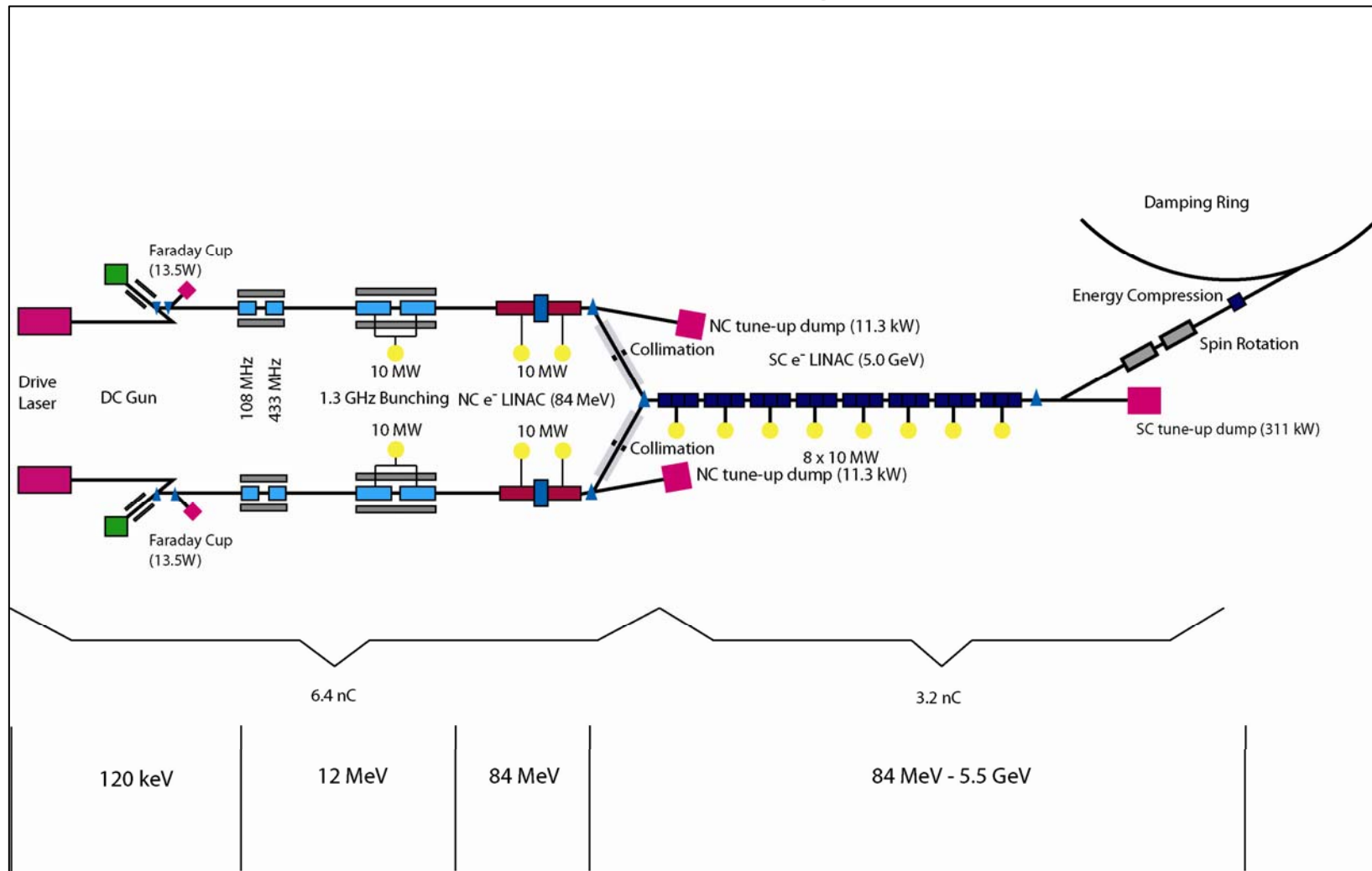


Polarized e^- Source Design Status

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Vancouver Layout





Design Changes Driven by Cost Savings Motivation

1. **Elimination of 1 Normal Conducting Beam Line saves:**
 - **Bunching system (2 SHB's, 2 L-Band Bunchers)**
 - **NC acceleration**
 - **RF Power**
 - **Associated CF&S (tunnel and facilities)**

2. **Installation of Source Laser System above ground saves:**
 - **Large 50 m x 10 m cavern**
 - **No extra shielding between laser system and beam line**

3. **These measures save about 25 % of overall cost for e- source**



Maintaining Redundancy

High level of redundancy is kept by maintaining critical components:

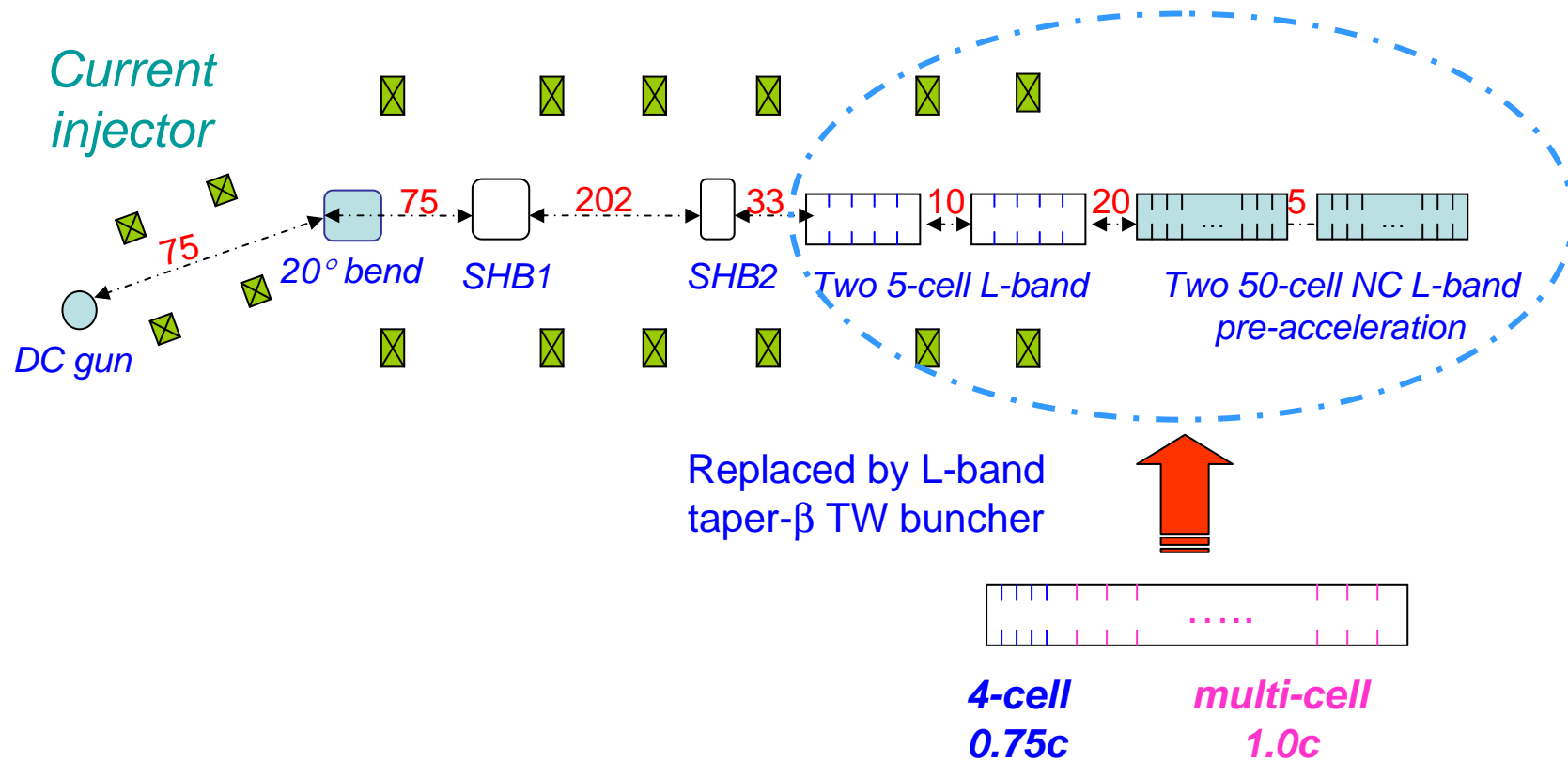
- 2 Drive Laser Systems with simplified Access
- 2 Polarized Guns
- 1 Spare Klystron for Bunching (L-band) and NC Pre-Acceleration



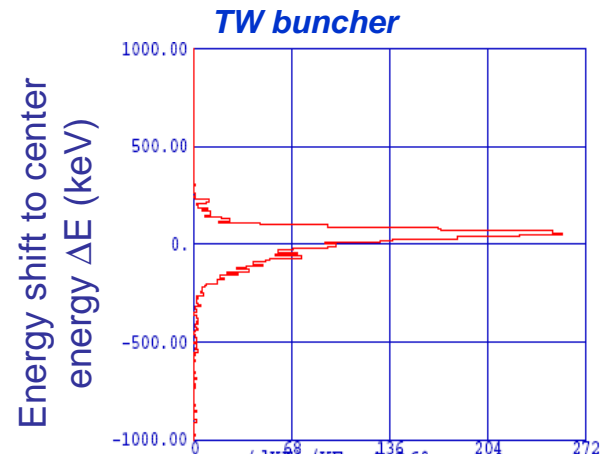
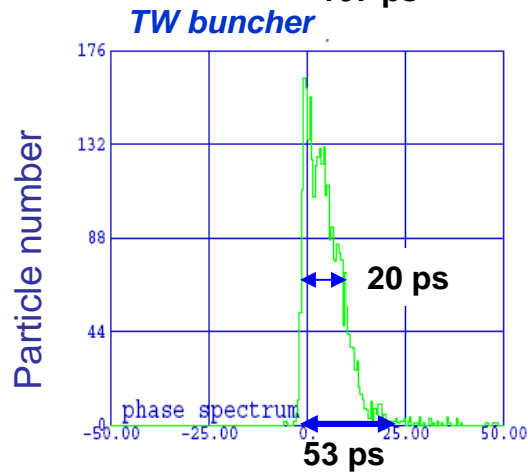
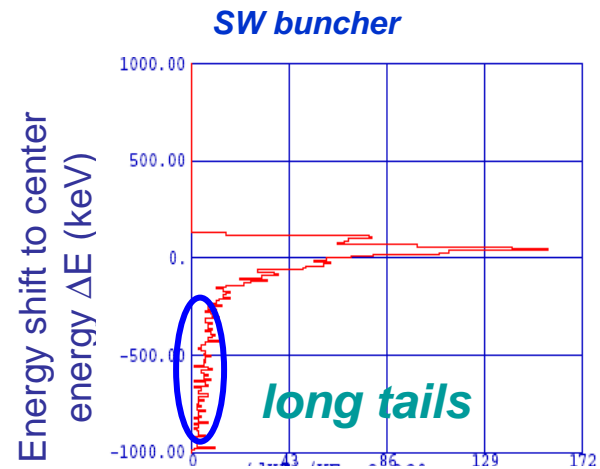
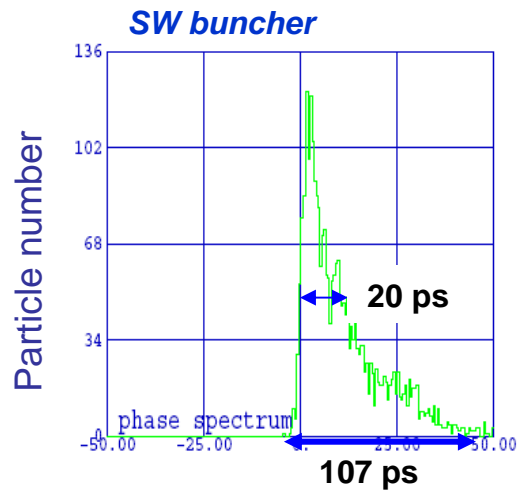
Design Changes driven by Performance and Operational Improvement

- Replacement of L-Band Bunching and Pre-acceleration by TW Bunching and Pre-Acceleration
- Modification of horizontal ‘Dogleg’ into vertical Chicane
 - Improved accessibility for removal of cryomodules and other components.

TW Buncher Schematic



TW vs. SW Buncher Performance: Phase and Energy



Phase spread (deg in L-band)

Particle number



Buncher Parameter Comparison at 40 MeV

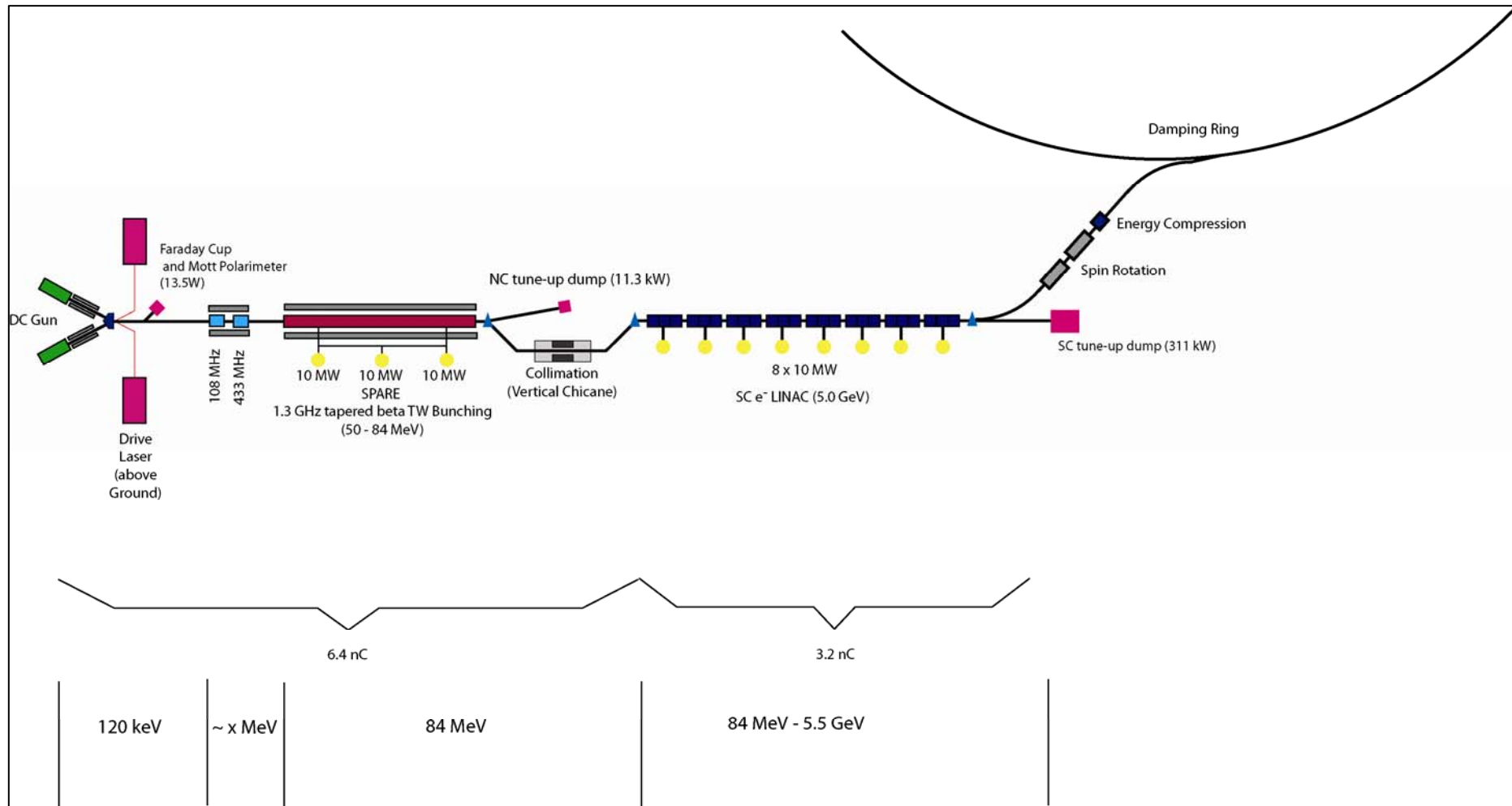
	TW	SW
Bunch length (FWHM)	20 ps	20 ps
Bunch length (FW)	53 ps	106 ps
Energy spread (FWHM)	83 keV	83 keV
Energy spread (FW)	0.6 MeV	1.5 MeV
$\epsilon_{n, rms}$	32 μm	42 μm
Charge at gun	6.4 nC	6.4 nC
Charge at 40 MeV	6.1 nC	4.4 nC



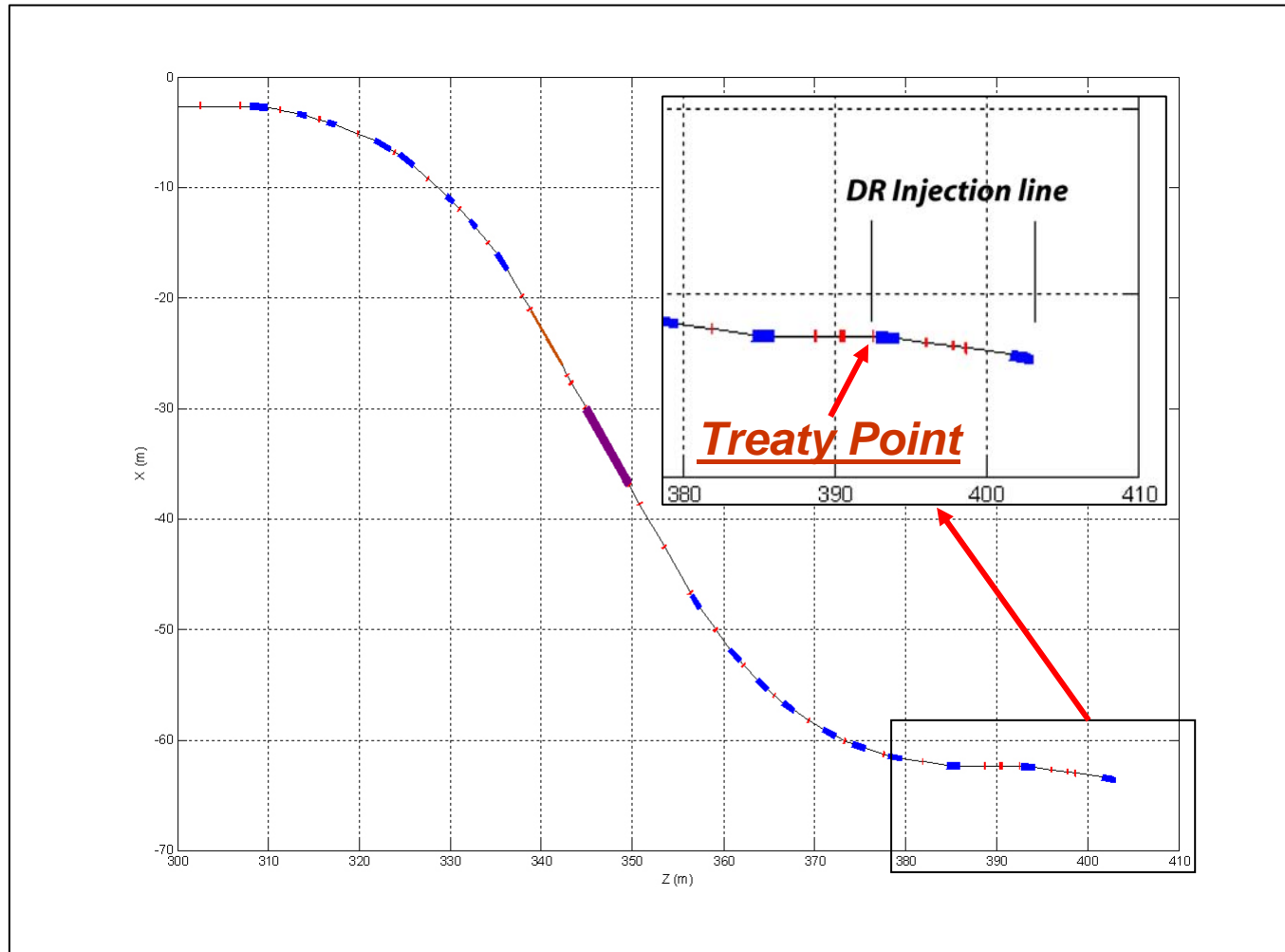
TW \rightarrow Improved Performance for all Parameters



Modified Beam Line Layout



eLTR and Interface to DR





R&D Program

Source Laser System R&D

Photocathode R&D

Gun (DC) R&D