

Test stand for the SRF gun

General overview of the foreseen beam diagnostics beam line

Dmitry Bazyl

MPY/MSL

Hamburg, 11.08.2022

Location: AMTF bunker



Layout of the diagnostics beam line

Overview of the key components

Aim:

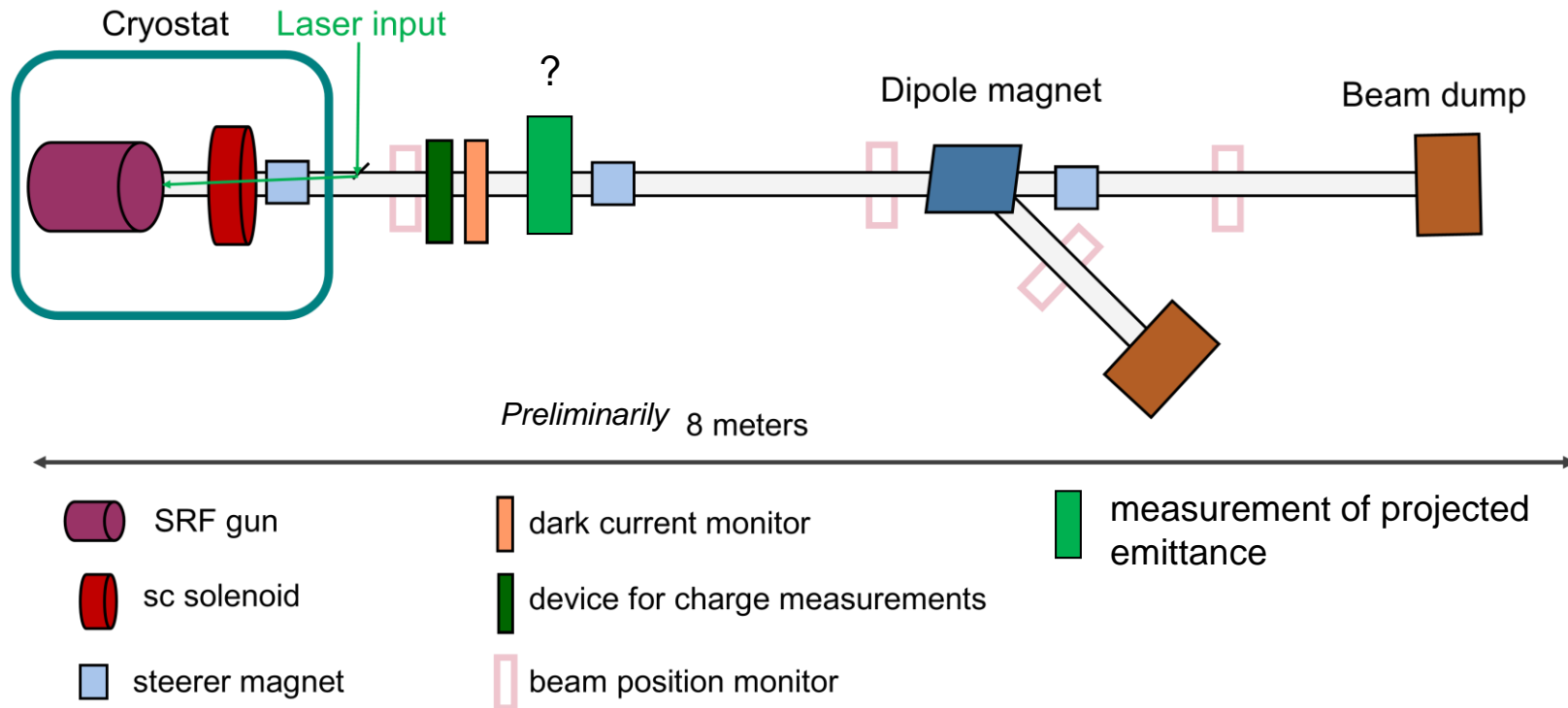
- CW SRF gun RnD not limited to DESY gun (including novel photocathodes)
- Evaluation of gun performance prior installation in the tunnel

Foreseen operational parameters:

- Gun frequency 1.3 GHz
- Bunch charge 100 pC
- Bunch repetition rate 100 kHz – 1 MHz
- Beam energy 3.5-6 MeV

Foreseen measurements:

- RF parameters of the SRF gun
- Bunch charge
- Dark current
- Beam energy



Current status:

- Components will be added in several steps
- Layout is settled
- NX model is being created to evaluate foreseen positions of components
- Dipole magnet is reserved
- Key diagnostics components to be ready end of this year/first quarter of the next year
- Design of beam dumps ready

Layout of the diagnostics beam line

List of components

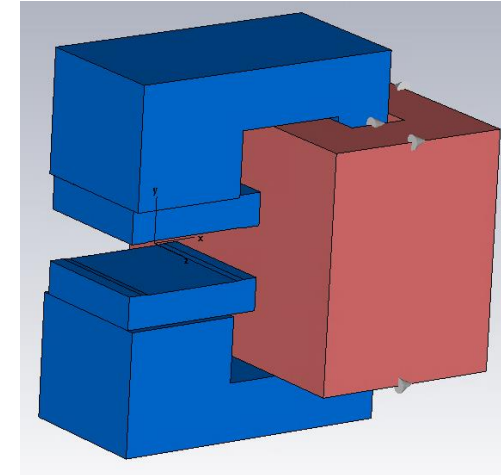
Provided by MDI:

- 1 Dark current Monitor (DaMon)
- 1 Toroid
- 3 or 4 BPMs
- Several Beam Loss Monitors (BLMs)
- 3 or 4 screen stations with Off- and On-axis screens

Other:

- 1 dipole magnet
- Number of steerers and their design is not yet defined

Typ TCA (C-shape Dipol)
from FLASH with
optimized pole shoes



Discussion

Open questions

- **Measurement of transverse projected emittance:**
 - Solenoid scan? Pepper pot? Slit? Other ideas? (100 pC; 6 MeV beam; transverse projected emittance around 0.4 μm)
 - How to approach this problem?
- Fast kicker for transverse emittance measurements in CW mode? Too complex and unnecessary?
- Steerer magnets – design, positions
- Design of pole shoes of C-shape Dipol from FLASH
- It was suggested by MDI to include two quadrupole magnets (?)

Contact

DESY. Deutsches
Elektronen-Synchrotron

www.desy.de

Dmitry Bazyl
MPY
dmitry.bazyl@desy.de
2807