The progress report on Gun5.2 Operation

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On behalf of PITZ Team
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HELMHOLTZ

DESY.

PITZ
Photo Injector Test Facility
Zeuthen

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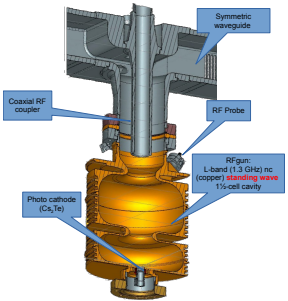
PITZ RF gun

- L-band (1.3 GHz)
- normal conducting (copper)
- standing wave
- $1\frac{1}{2}$ - cell cavity
- max. power $\sim$7 MW
- max. gradient 60 MV/m
- max. RF pulse length: 1ms



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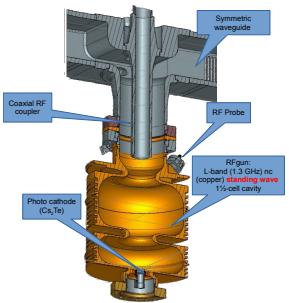
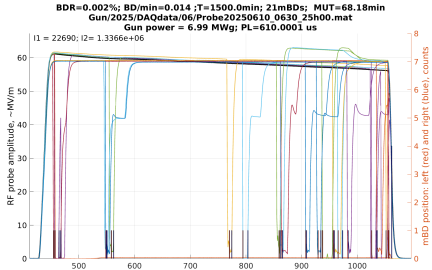


What is new?

- Two in-cavity symmetric RF probes allow for improved LLRF regulation
- New motorized solenoid mover to minimize misalignment
- Improved cathode contact spring to improve point-to-point contact
- Symmetric wave-guide power coupling to minimize transverse kick induced by RF

Some achievements



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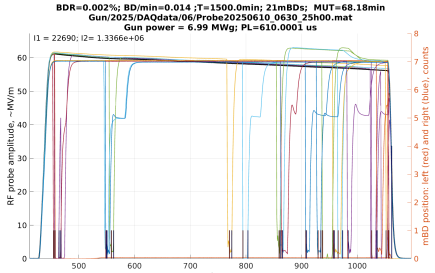

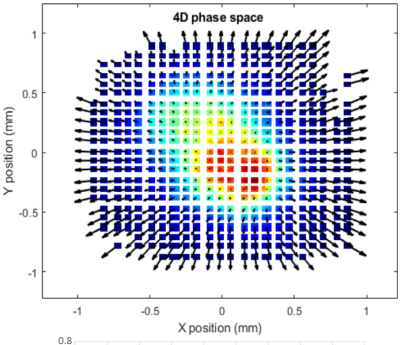

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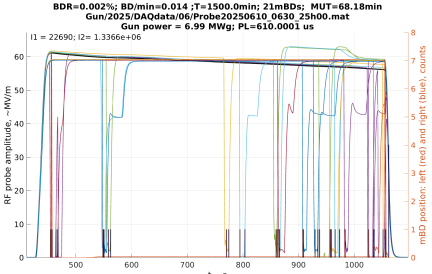

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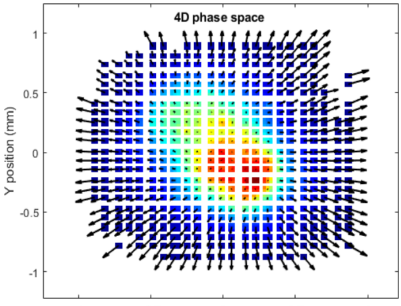

- Transverse emittance (gun quads off/off): 0.667/0.553 mm.mrad.
- Much better emittance, but still see X-Y discrepancy.
- The bucking coil needs to be tuned to get even better emittance.

X.Li

C. Richard

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- New laser beamline get into operation at PITZ ==> installation ongoing
  - We will work on different laser profiles on cathode