Gun Comparisons

R28-2 vs. R30-4

140 and 180 kV R28-2 operational settings scaled to 200 kV for R30-4

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Simulation information

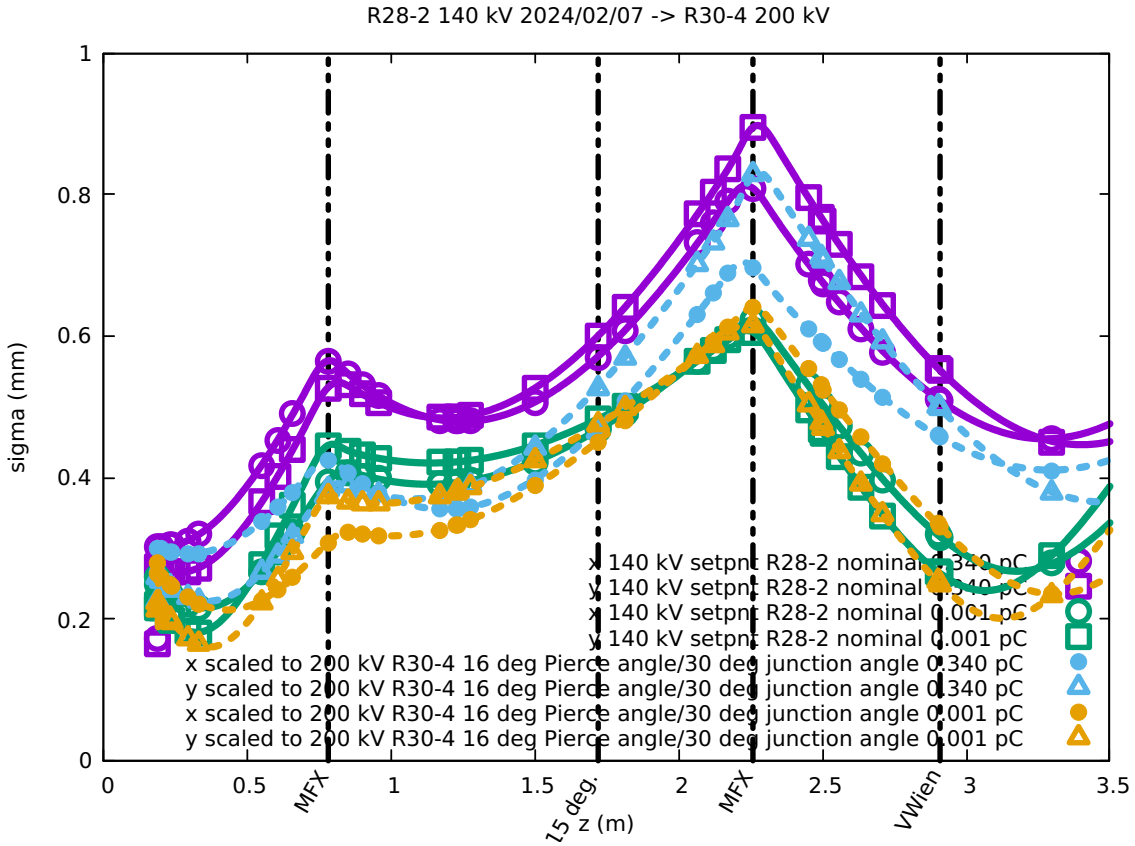
- Gun HV:
  - R28-2: 140 and 180 kV
  - R304: 200 kV
- Spot Size on cathode: 0.54 mm (sigma)
- Pulse Length: 45 ps FWHM

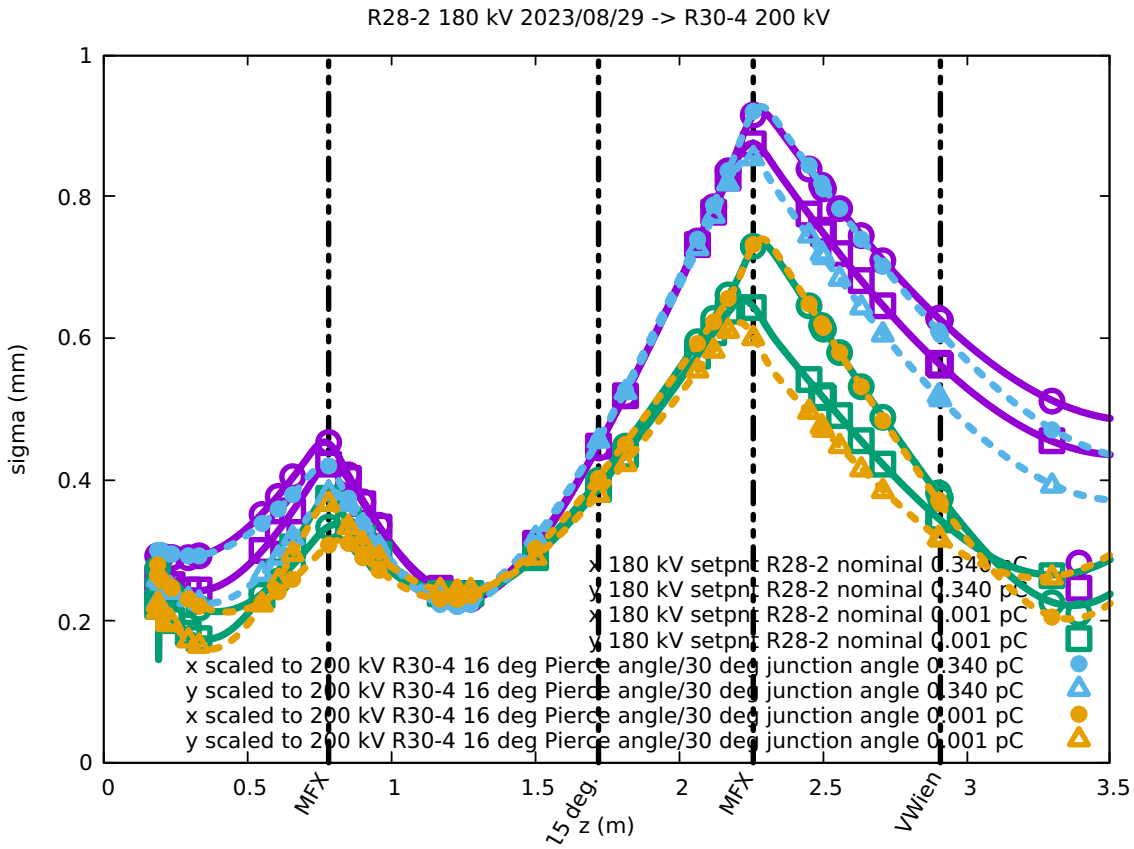
- Distribution-based simulations
  - 10k macroparticles
  - Start at z=0.19 m from cathode

- Beamline simulation results
  - R28-2: 140 and 180 kV operational settings
  - R30-4: operational settings scaled to 200 kV
  - Settings used as-is (no tweaks)
  - MFX2I01 and MFX1I03 modeled as (ideal) SW solenoids

- R28-2 nominal
  - 140 and 180 kV
  - Field map extent in z: 18 cm
  - Recessed cathode (0.18 mm)
  - Distributions
    - 0.001 and 0.340 pC
    - Generated by Max
    - Mean quantities removed
      - E.g., gun kick removed
    - In simulation shift distribution to mean t from original 170 uA no gap field map simulation for z=0.19 m
- R30-4 proposed replacement
  - 16° Pierce angle
  - 30° junction angle
  - 200 kV

Beam sizes: R28-2 140 kV and 180 kV settings scaled to 200 kV for R30-4





140 kV settings	Scaled to 200 kV
MFX2I01 1159.934 mA	1421.729 mA
MFX1I03 -970.234 mA	-1189.210 mA

180 kV settings	Scaled to 200 kV
MFX2I01 1640.652 mA	1743.728 mA
MFX1I03 -1187.912 mA	-1262.544 mA

Max's 200 kV calculated optimized settings
MFX2I01 1694 mA
MFX1I03 -1496 mA

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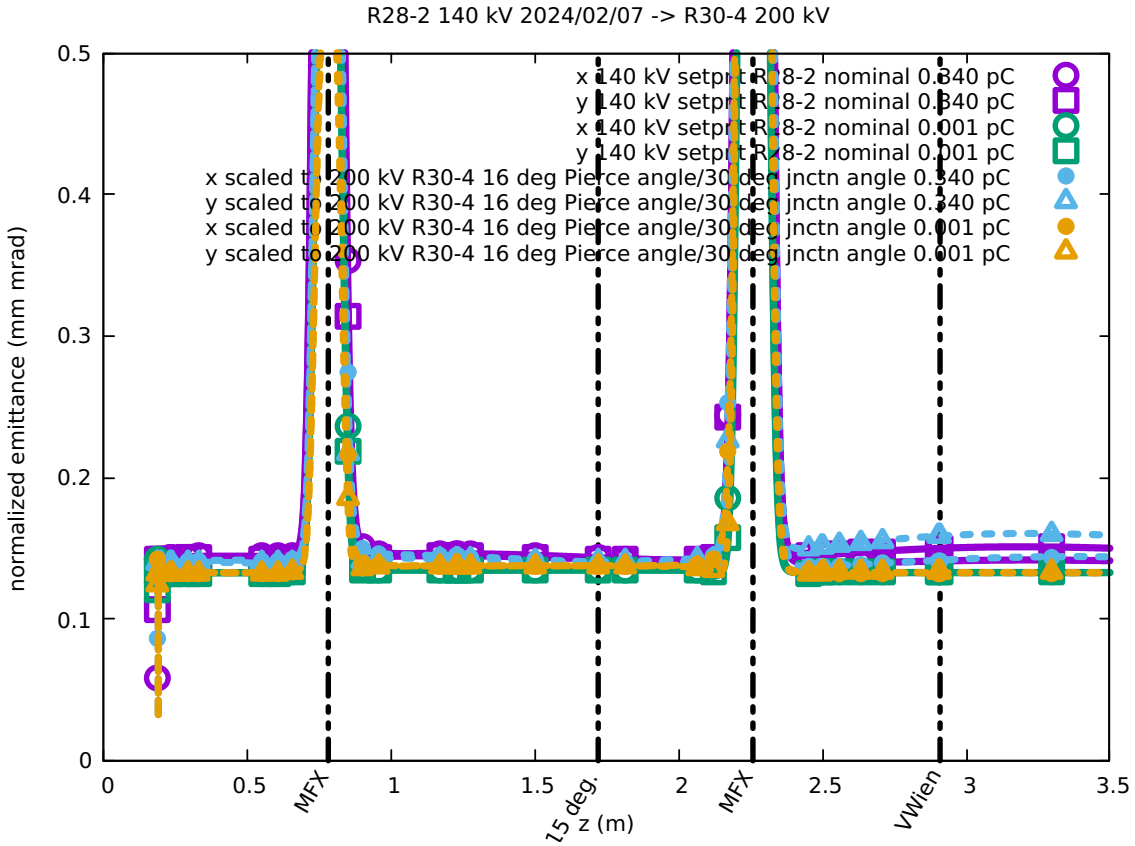
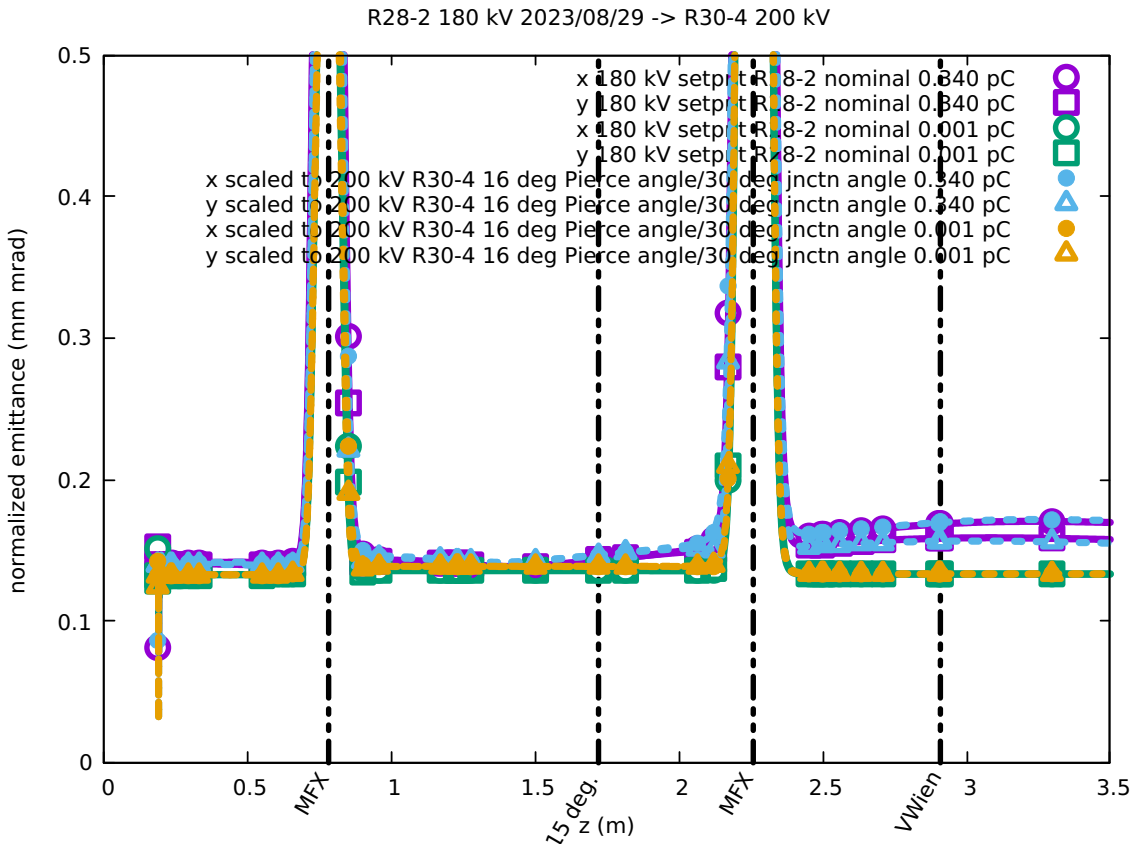
Emittances: R28-2 140 kV and 180 kV settings scaled to 200 kV for R30-4





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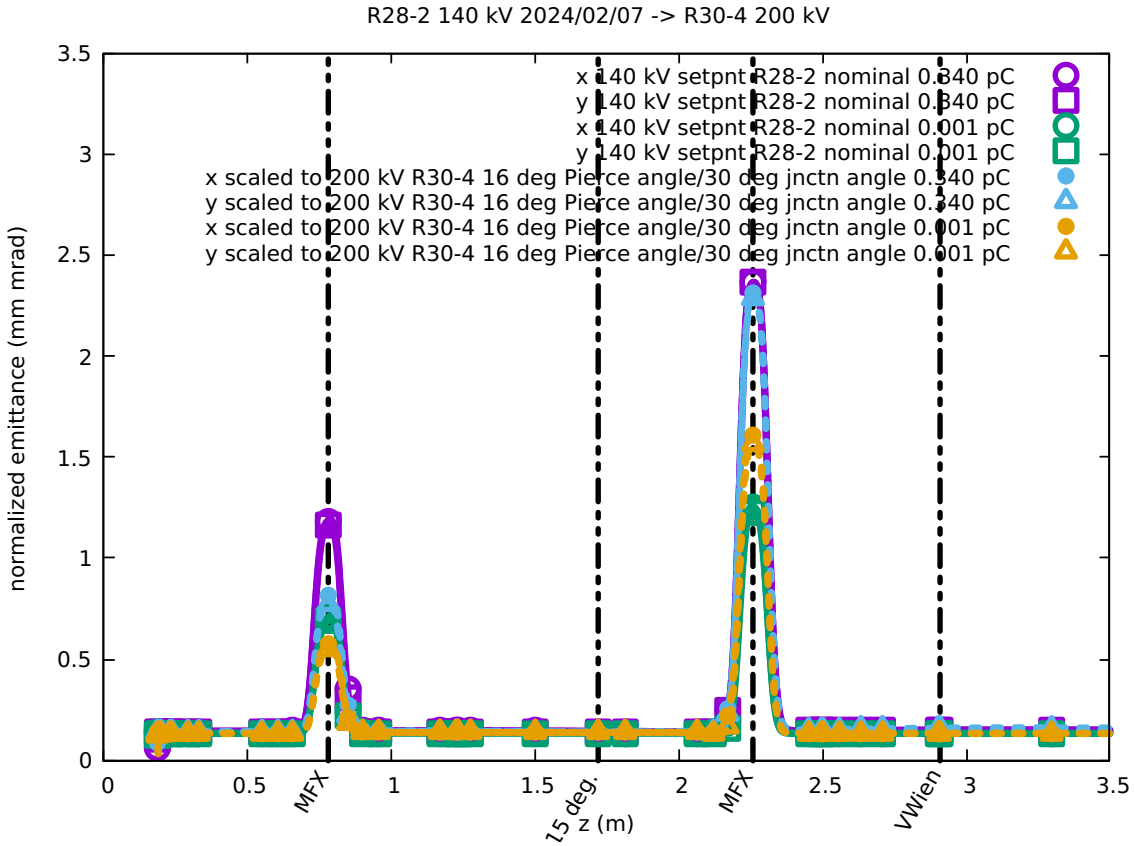

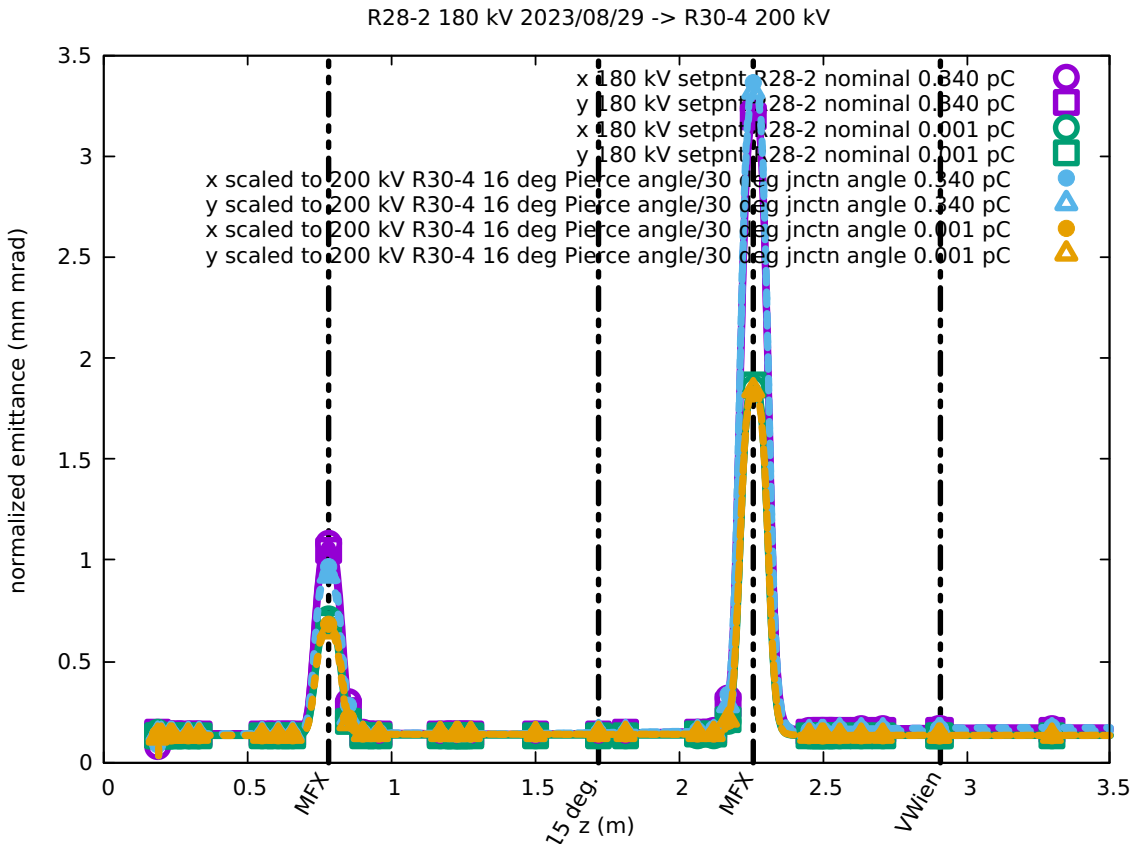

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