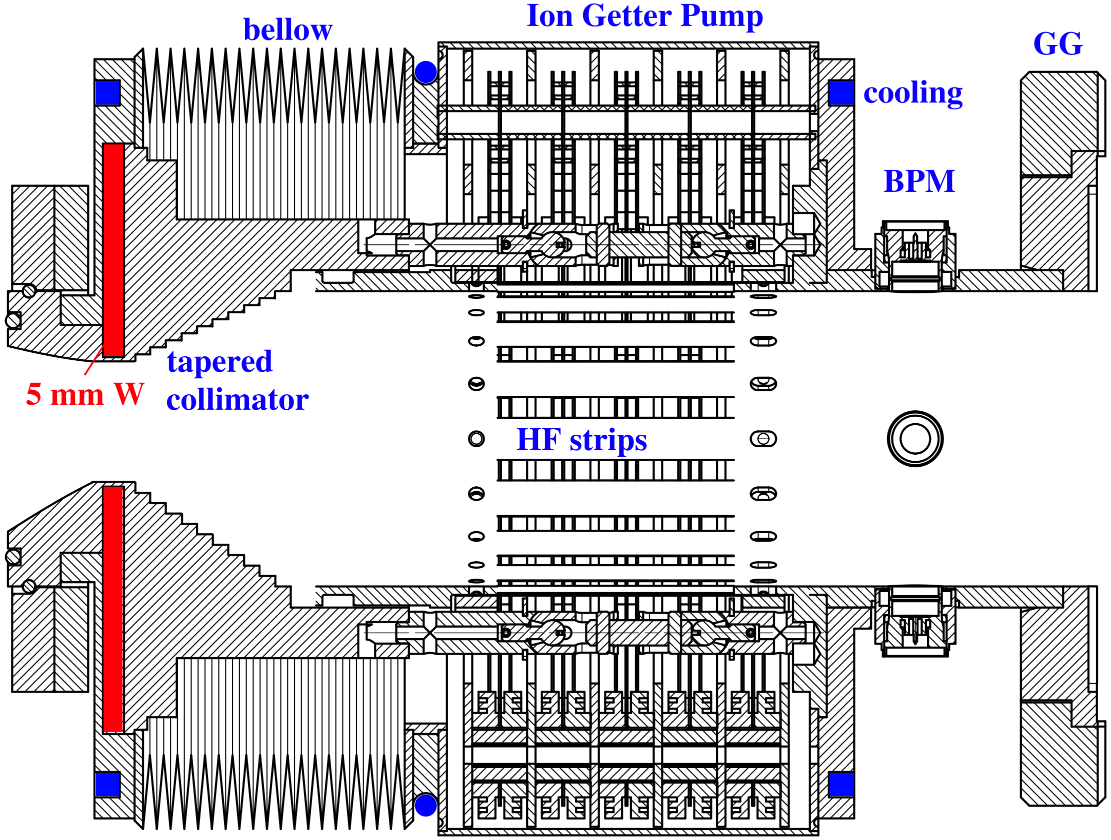
Modifications around H1

- New C5b collimator with integrated ion getter pump.
- Lead shield between C5a and C5b.
- Larger IGPs and RGAs at NR 3.6 and 6.0 m.
- Backward scintillators extended to NR 11 and 19 m.

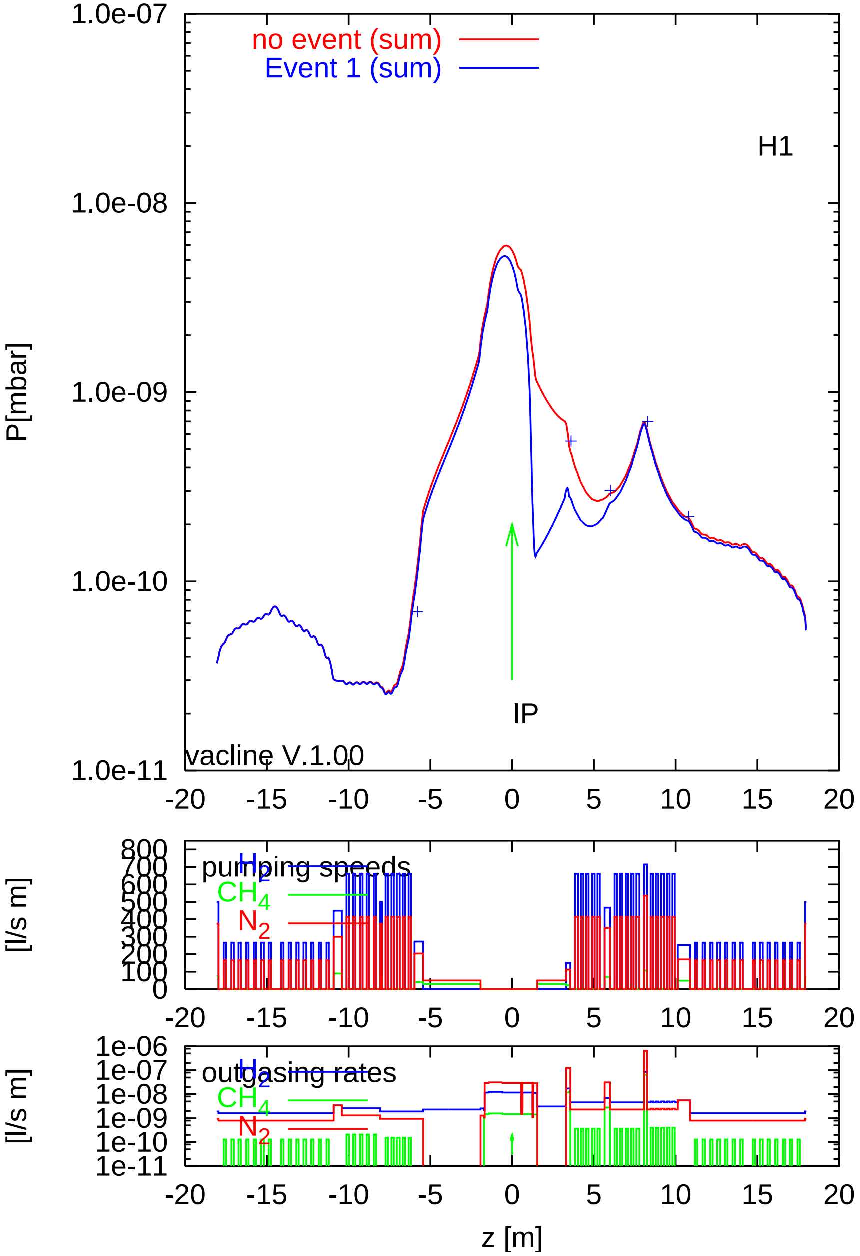
New C5b collimator with integrated ion getter pump

At NR 1.45 m:



- 5 mm tungsten plate outside of stainless steel beam pipe.
- Add taper to reduce higher order mode heating by 15–30%
- Add water cooling to reduce temperature peaks at injection.
- Add an integrated ion getter pump with 400 ℓ/s.
- After assembly: 4 day bakeout at 148^{o}C.
- Pump tested OK in 1.16 T field.
- Installed 12.6.
  Included in HERA display and archive but HV (and solenoid field) still off.

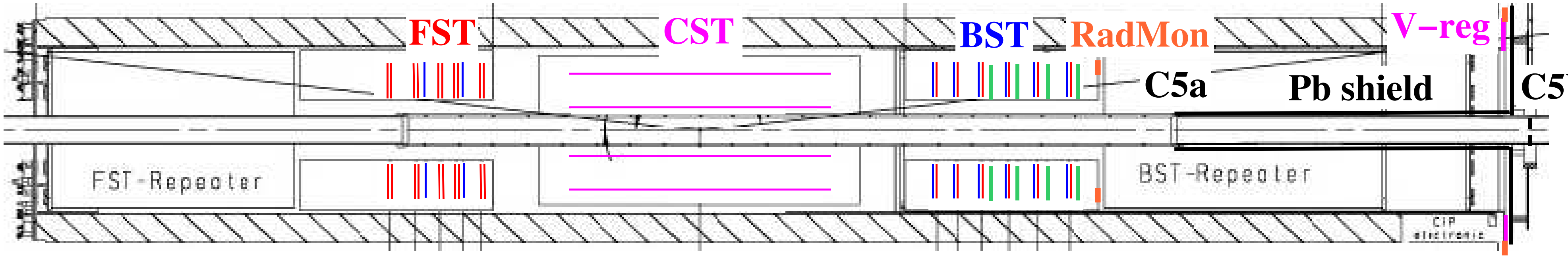
Pressure profile and new H1 IGP



- Pressure profile simulation for 2002 in red.
- Adding a 400 l/s ion getter pump at 1.5 m right of the IP produces a sharp minimum, extending into the GG magnet.
- Folding with the CJC sensitivity we expect a reduction of 1/3 in chamber currents.

Radiation protection

- Severe radiation damage in Silicon Tracker electronics at NR 1.3 m.
- Dosimeters show 10–30 kGy.
- Possible source: direct SynRad on C5b at injection or missteering at 27.6 GeV. C5b upper edge blackened.
- Central and forward Silicon OK, dose 0.03–0.1 kGy.
- 2 mm Pb shield around beam pipe between C5a and C5b.
- Shields CST voltage regulators and BST repeater.
- CJC SynRad rate reduced by factor 4.
- New radiation monitors: Peltier-cooled Si diodes with threshold-free current integration and charge-to-frequency conversion.

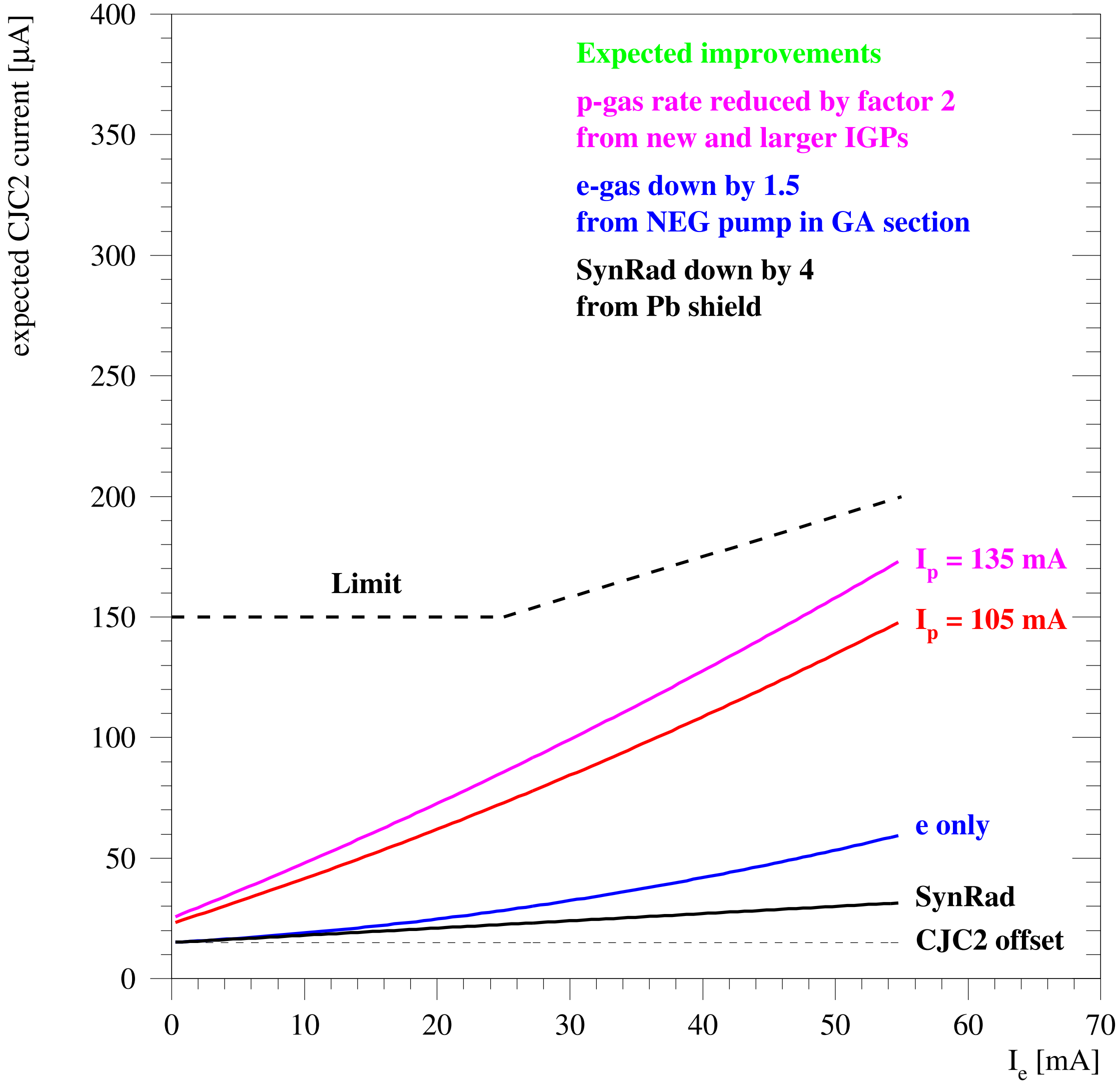


New IGPs and RGAs

At ABS1 (NR 3.6 m) between GG and GI1:

- Pumping conductance at ABS 1 and 2 (-3.6 and -6.0 m) increased by cutting out every 2nd RF grid bar.
- Getter pumps at -3.6 and -6.0 m: replaced 75 ℓ/s by 150 ℓ/s pumps.
- Rest gas analyzers at -3.6 and -6.0 m installed, for in-beam diagnostics.
- RGAs work well, spectrum shows H_2, H_2O, CO, CO_2. Pressure agrees with IGP.

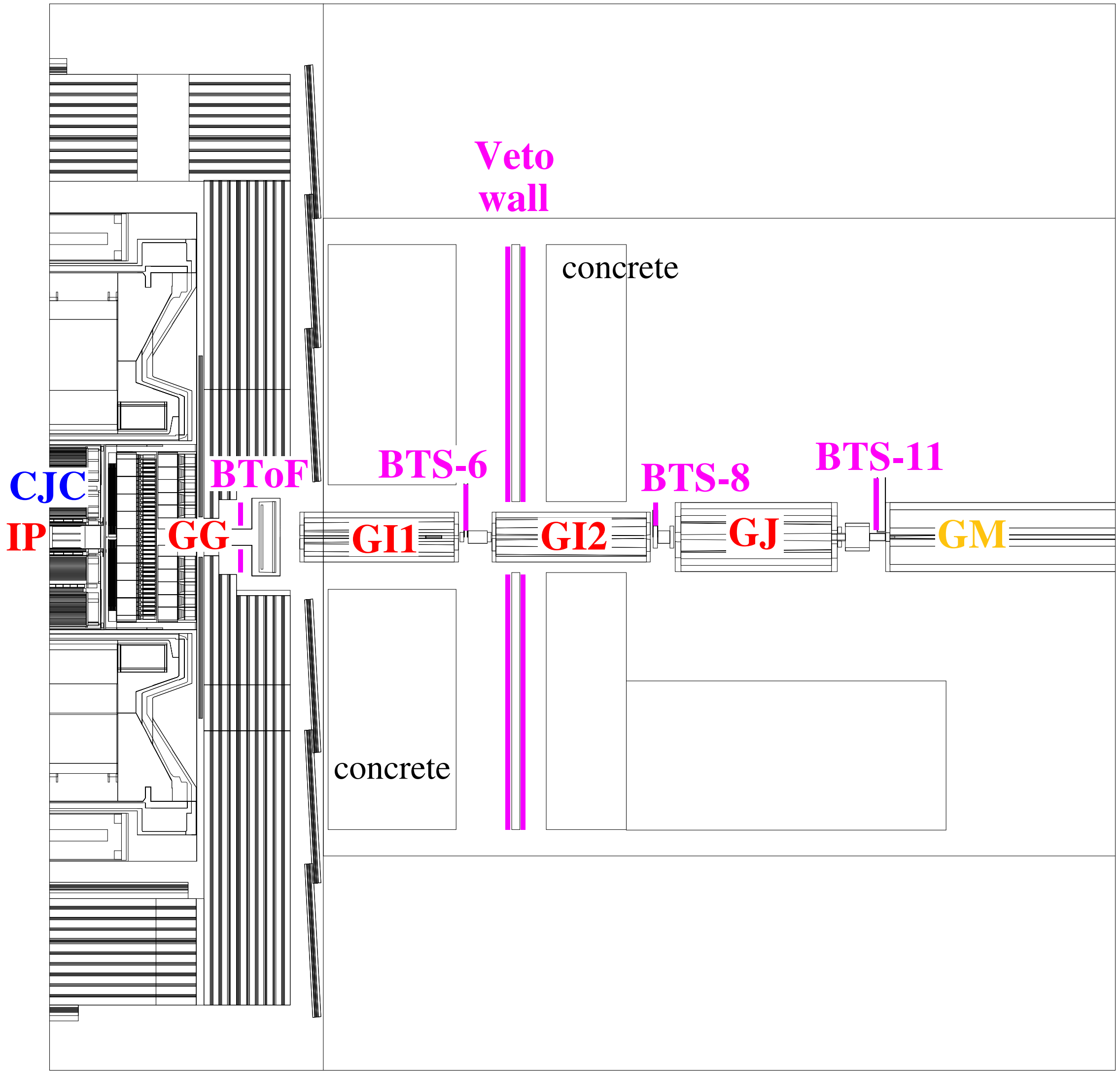
Improved extrapolated chamber current



Assumptions:

- Factor 2 lower pressure from new IGP, larger IGPs at NR3.6 and NR6.0, and long-term trend.
- Reduce e-gas rate by 1.5 with new NEG pump in GA section.
- Reduce SynRad by 4 with Pb shield.
- This should allow safe operation at $55 \cdot 105\,\text{mA}^2$ if no (quadratic) surprises appear beyond I_e of 30 mA.

Backward Tagging System



- Scintillators at NR 6 and 8 m had clean signals and will be reinstalled.
- NR 11 m was swamped by SynRad and will be reinstalled with 1–2 cm lead shield.
- New counter prepared for NR 19 m (between p BQ and GN).