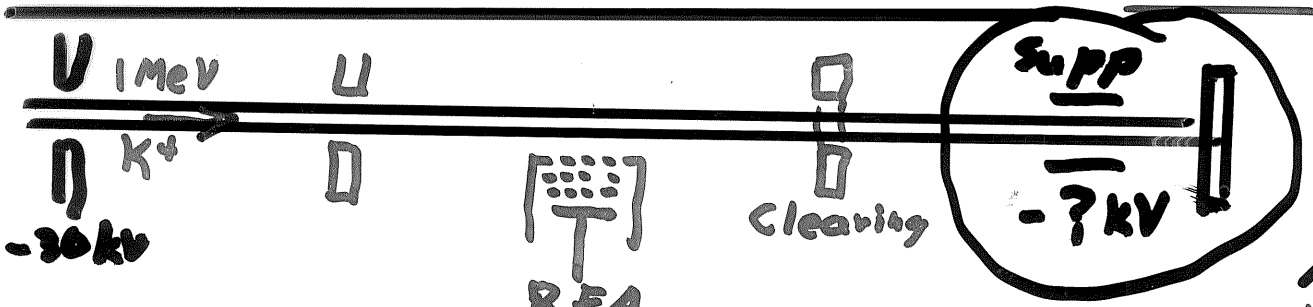
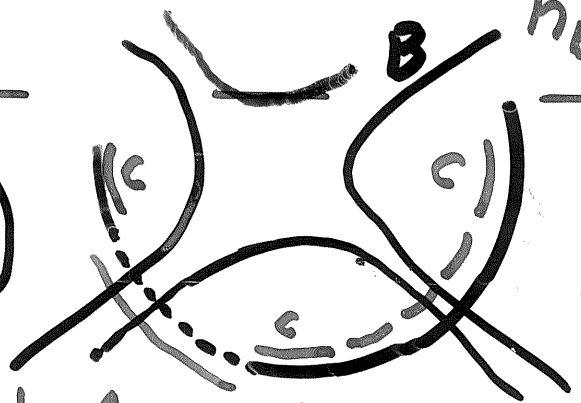
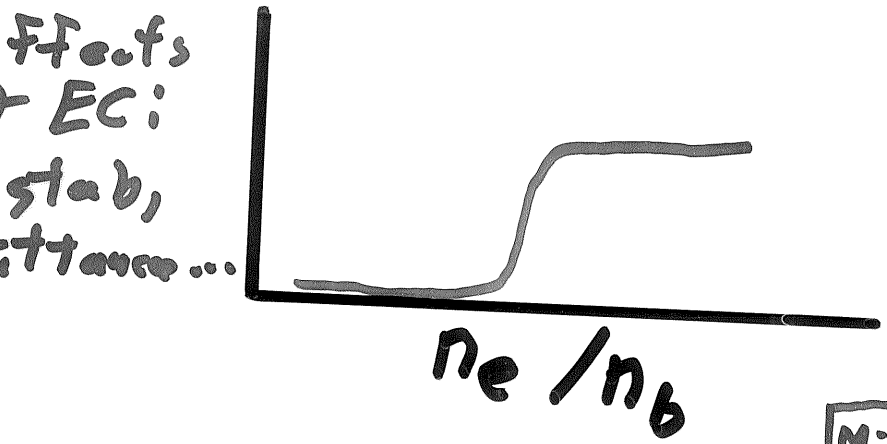
Can we control $\frac{n_e}{n_b}$ in quads at linac?



Can we measure $\frac{n_e}{n_b}$?

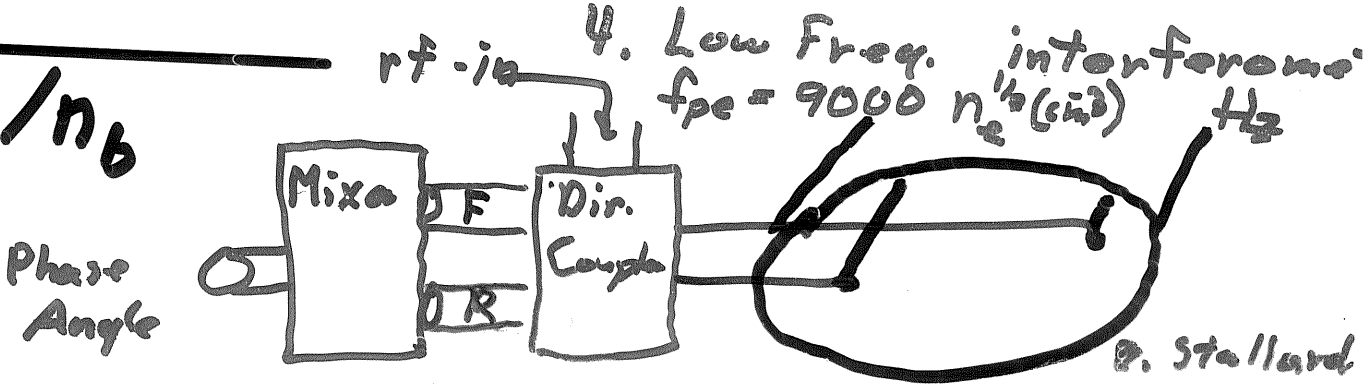


1. Azimuthal array of electrodes.
2. Grid shields capac. coupling to beam
3. RFA
   a) Expelled ions (gas) $E_i^{max} = \Phi_b$
   b) Trailing edge e^-



Effects of EC: Instab, emittance...

4. Low Freq. interferom.
$f_{pe} = 9000\, n_e^{1/2}(cm^3)$ Hz



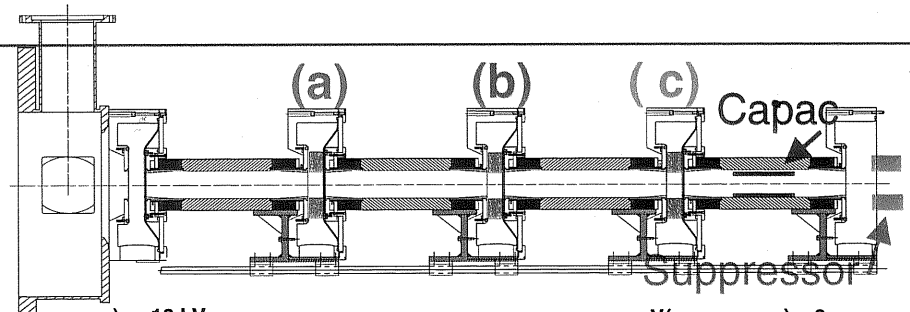
A. Molvik

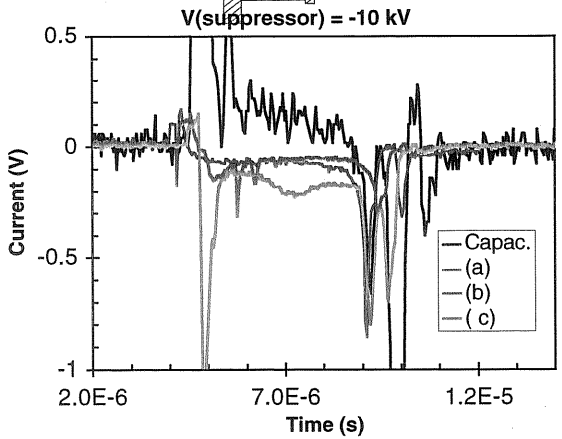
New tools: suppressor ring, clearing electrodes between quads

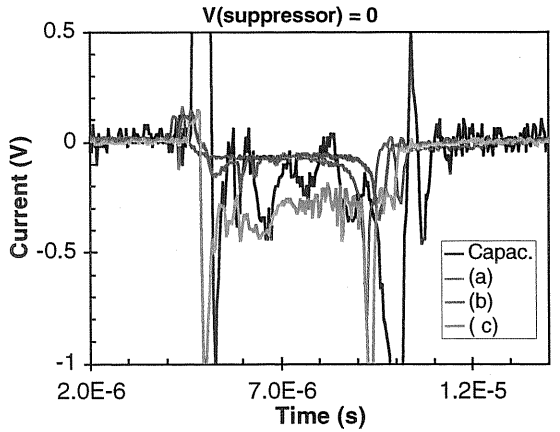
- Suppressor blocks electrons from quads – improves beam quality
- Clearing electrodes work: upstream indep. of down-stream changes
- Measure drift velocity of e⁻?

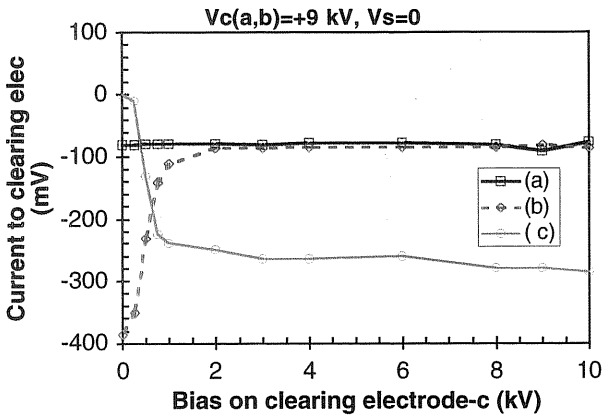
$$\frac{v_e}{v_b} = \frac{2I_e}{I_b} = 0.14$$

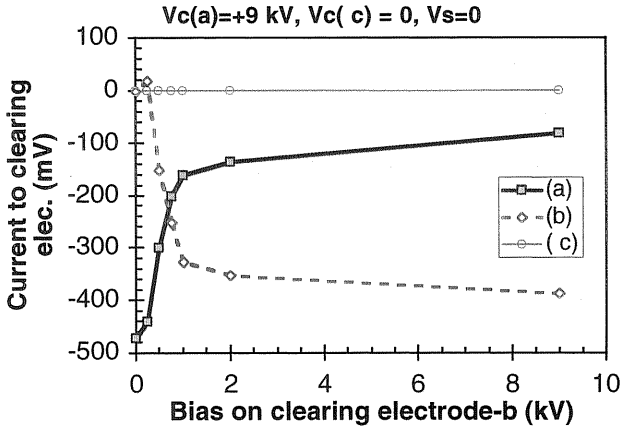
- Capac. electrode: polarity varies with V_s
- Can suppressor reduce e⁻ to reproducible trickle?







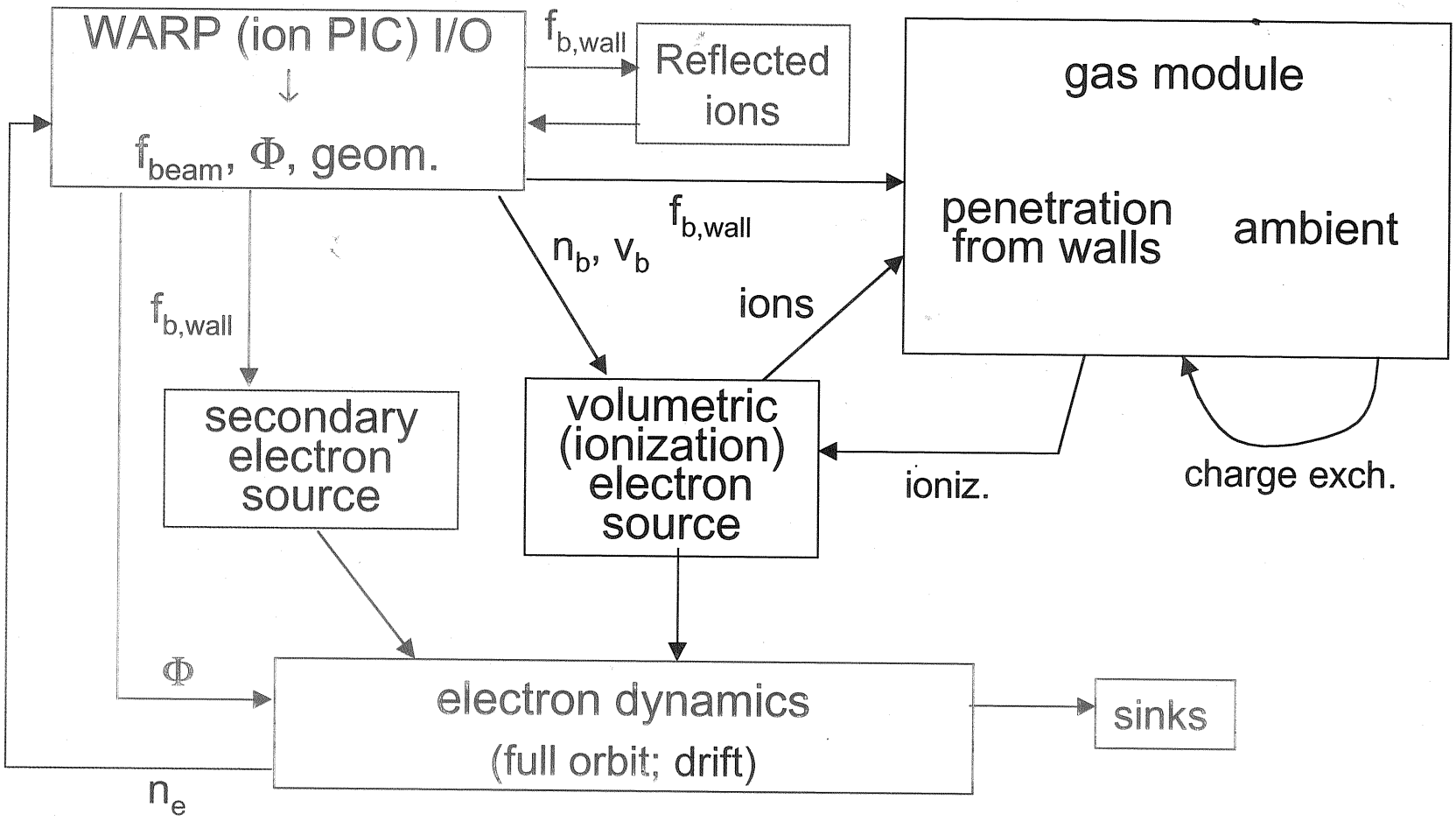




A. Molvik

Toward a self-consistent model of electron effects

¥ Plan for self-consistent electron physics modules for WARP



¥ Key: operational; implemented, testing; partially implemented; offline development

In search of a mechanism for gas desorption

- SEY = secondary emission coef.
- Γ_0 = Gas desorption coef.
- Γ_0 scales with dE/dx(elec) for electronic sputtering
- Improved background subtraction for 300 kV_a
  [Compare open vs. solid green diamonds]
- Experiments and analysis continuing