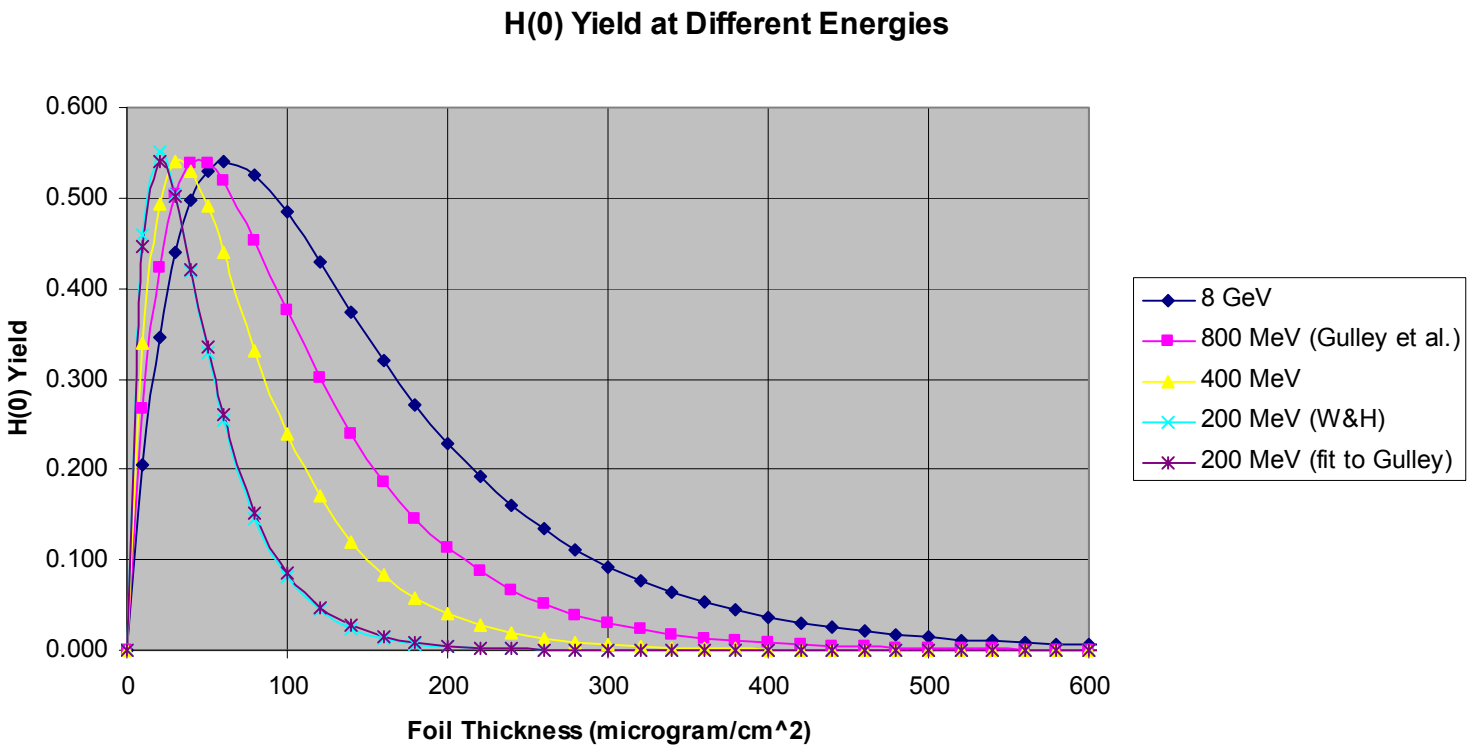
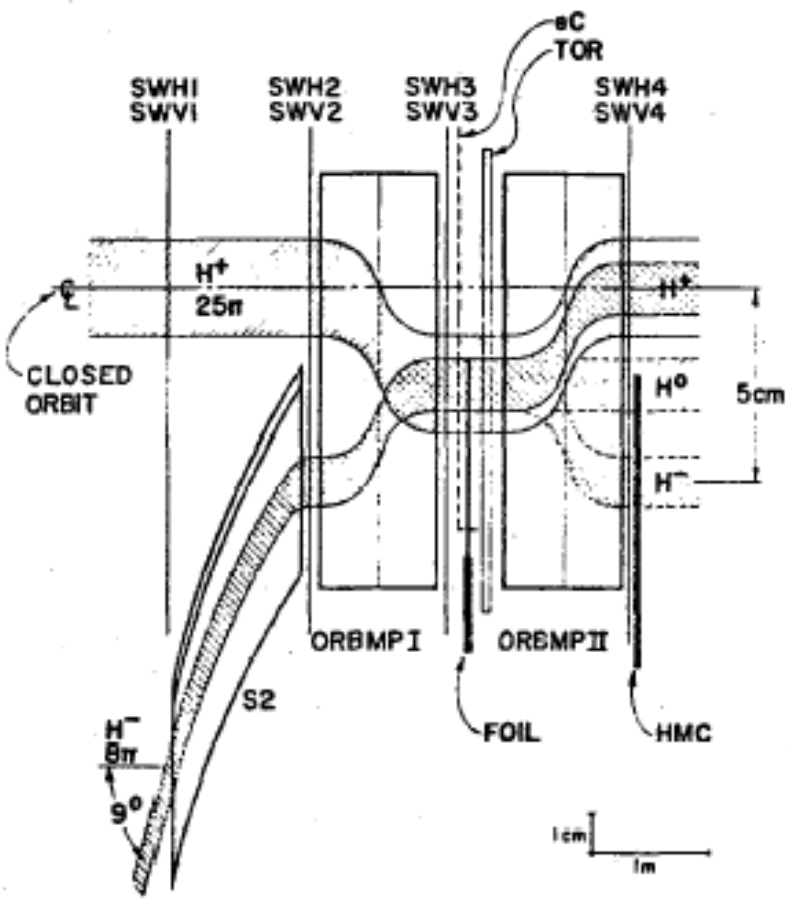
Energy Dependence of H(0) Yield

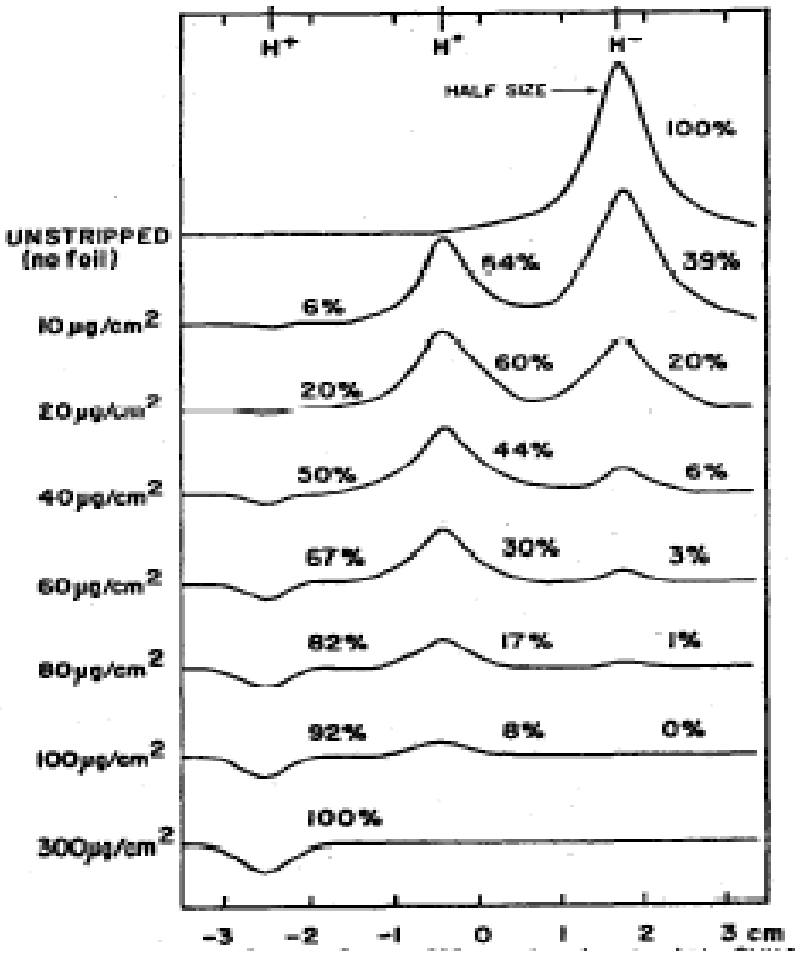


Webber-Hojvat 200 MeV Measurement (1979)



- Two wires:
  - Vertical: sum of three ions
  - Horizontal: signal of each ion
  - Toroid in the transport line: normalization for fluctuation in linac beam current
- 1-turn injection
- DC B-field set to lower value to get rid of circulating beam

Webber-Hojvat 200 MeV Measurement (cont…)



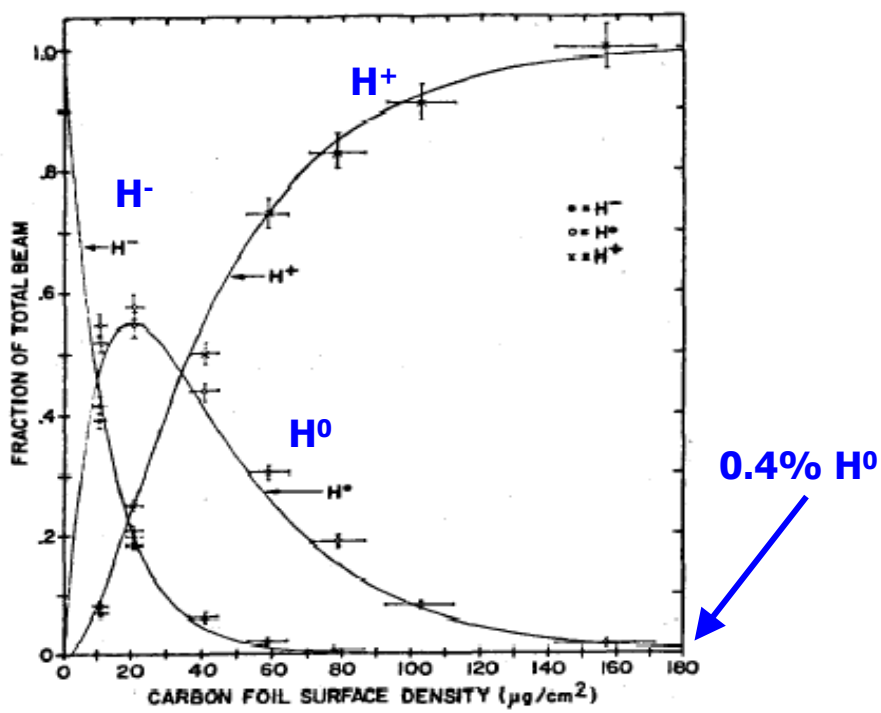
- Peak separation: ~ 2 cm
- Wire sensitivity calibration for three different ions by minimizing:

$$f = \Sigma_i \left| \frac{1}{V_o^-}(V_i^- + \alpha V_i^+ + \beta V_i^o) - 1 \right|^2$$

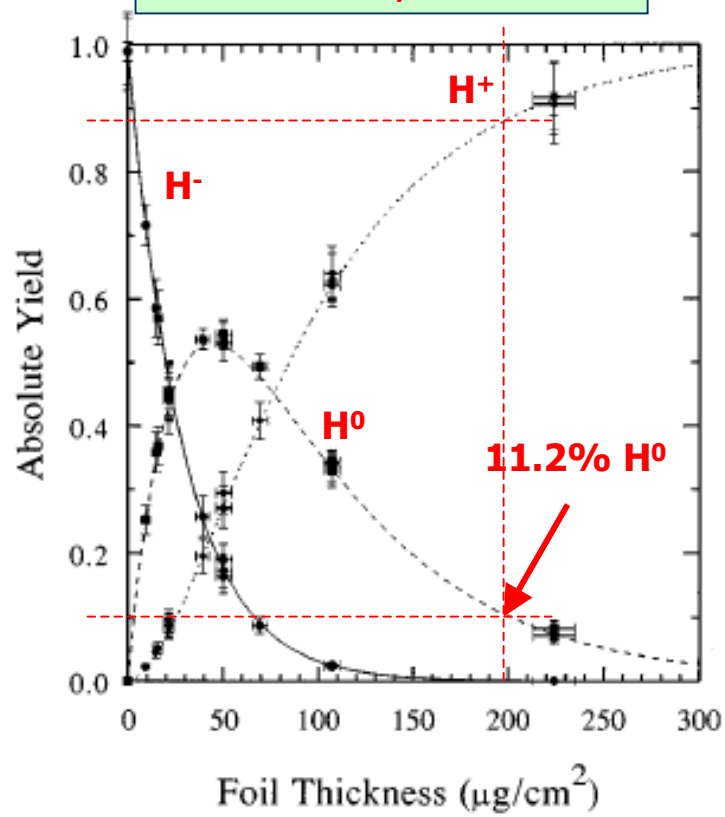
$$\alpha = -13.5,\ \beta = 2.2$$

(3) H^- Foil Stripping Efficiency – Measurements

Webber & Hojvat, 1979
Fermilab linac, 200 MeV



Gulley et al., 1996
LANL linac, 800 MeV



Measurements of Electron Loss Cross Section

	Webber & Hojvat 200 MeV	Gulley et al. 800 MeV	
$\sigma(-, 0)$	$(1.56 \pm 0.14) \times 10^{-18}$	$(0.676 \pm 0.009) \times 10^{-18}$	cm^2
$\sigma(0, +)$	$(0.60 \pm 0.10) \times 10^{-18}$	$(0.264 \pm 0.005) \times 10^{-18}$	cm^2
$\sigma(-, +)$	$(-0.08 \pm 0.13) \times 10^{-18}$	$(0.012 \pm 0.006) \times 10^{-18}$	cm^2

Scaling of Electron Loss Cross Section – Calculations

(unit 10^{-18} cm^2)

	800 MeV		200 MeV	400 MeV	8 GeV
		scaling			
σ(–, 0)	0.676±0.009	→	1.49 (1.56±0.14)	0.942	0.484
σ(0, +)	0.264±0.005	→	0.584 (0.60±0.10)	0.368	0.189
σ(–, +)	0.012±0.006	→	0.026 (–0.08 ±0.13)	0.0167	0.0086