



Cornell University
Laboratory for Elementary-Particle Physics



Early Results on a Search for Cyclotron Resonances in ECLLOUD

-- Collaboration with Eric Wilkinson --

These slides includes corrections arising from the discussion during the presentation.

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Electron Cloud Simulations Meeting

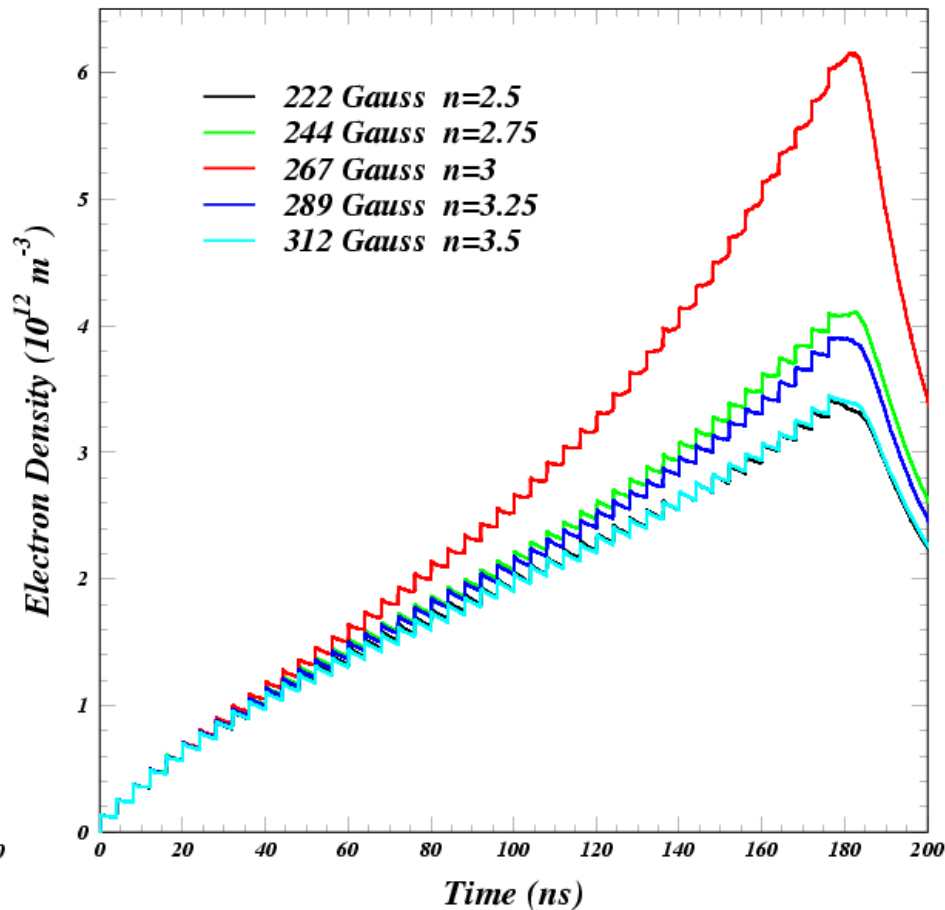
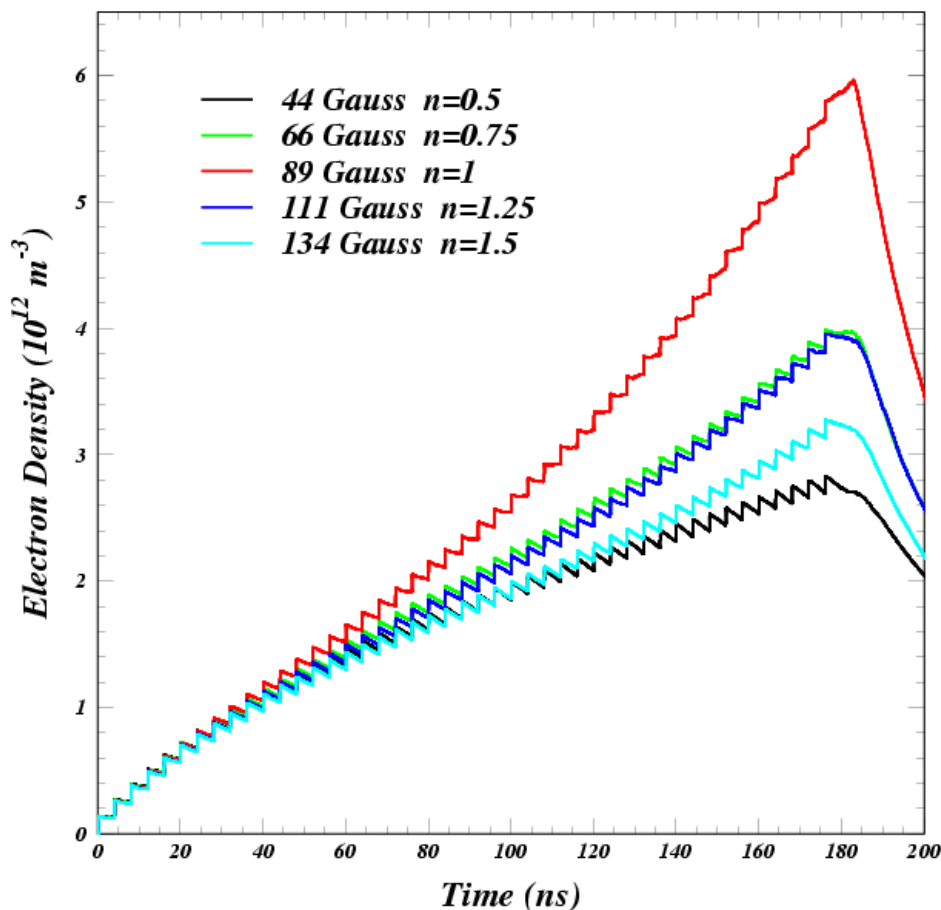
Wilson Lab

17 June 2009





9 cm x 5 cm elliptical v.c. 0.025 p.e./e⁺ 100% reflectivity $\delta_{\max} = 1.4$ $E_{\text{peak}} = 195$ eV $I_b = 2E10$ e⁺/bunch (1.25 mA)



These resonances were not easy to find !

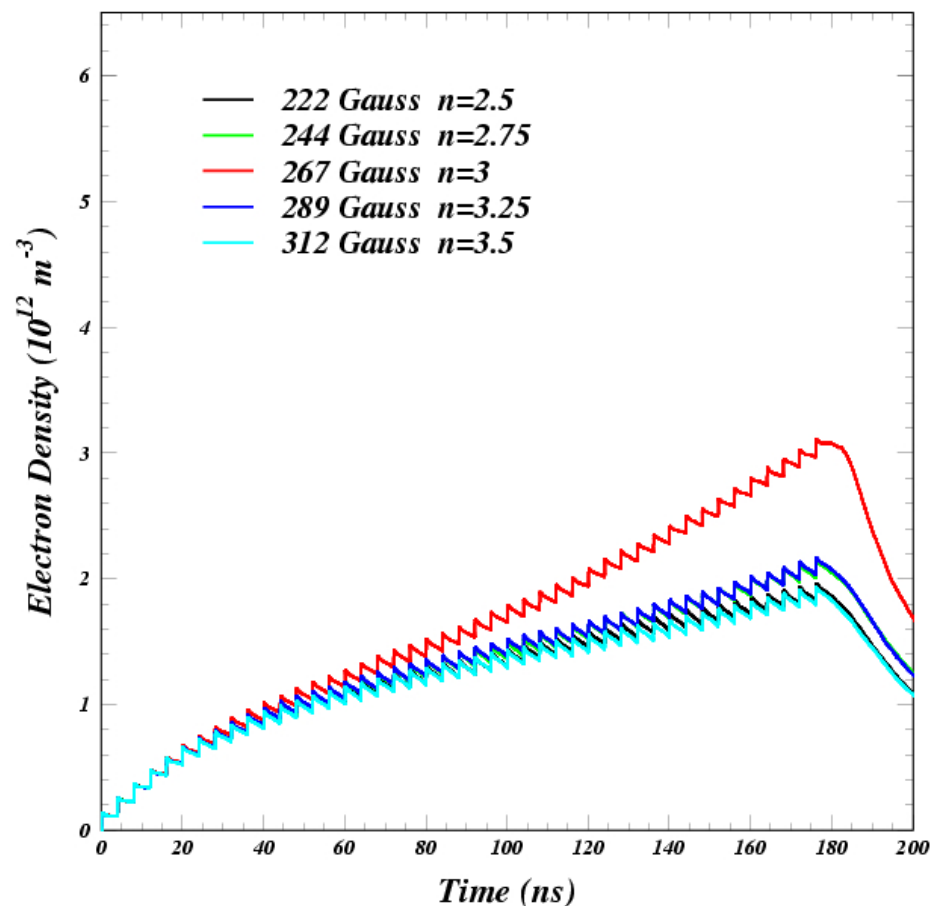
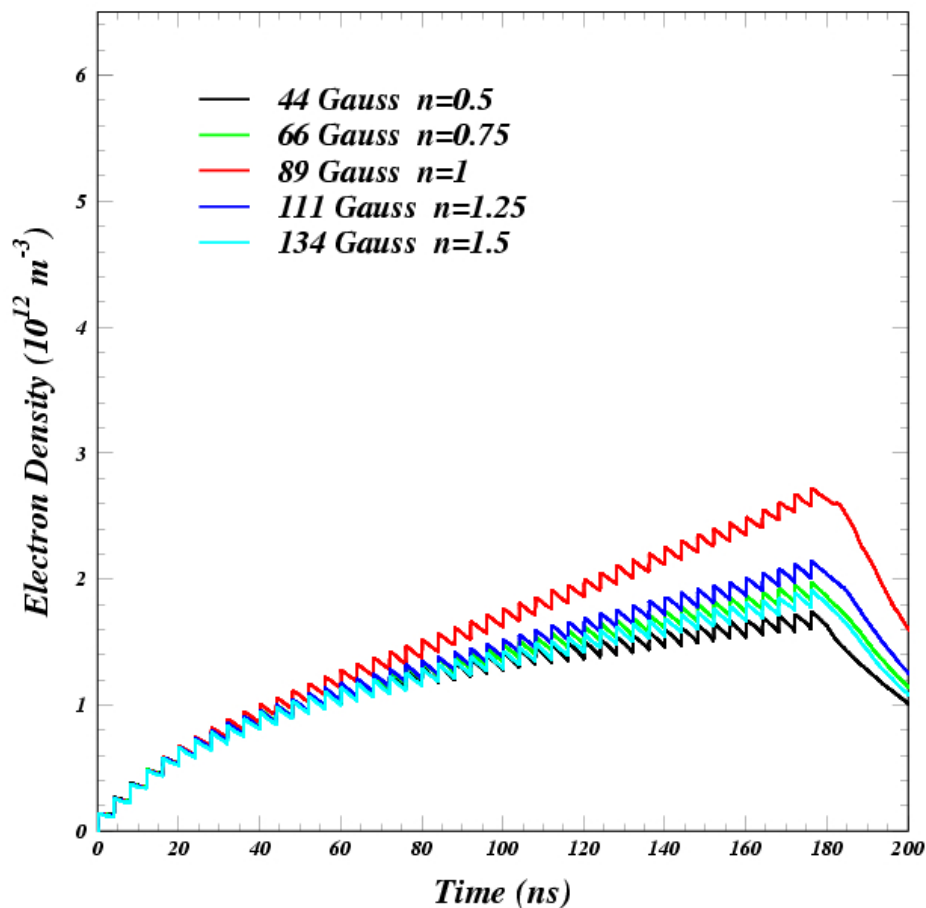
Resonant enhancement much smaller than the factor 2-3 calculated by POSINST for the PEP-II case.

NB: The v.c. is actually round (3.5 inch ID) and $\delta_{\max} = 1.4$ is unrealistically small for Al.



$$E_{peak} = 195 \text{ eV} \rightarrow 310 \text{ eV}$$

9 cm x 5 cm elliptical v.c. 0.025 p.e./e⁺ 100% reflectivity $\delta_{max} = 1.4$ $E_{peak} = 310 \text{ eV}$ $I_b = 2E10 \text{ e}^+/\text{bunch}$ (1.25 mA)



Resonance remains for lower SEY.

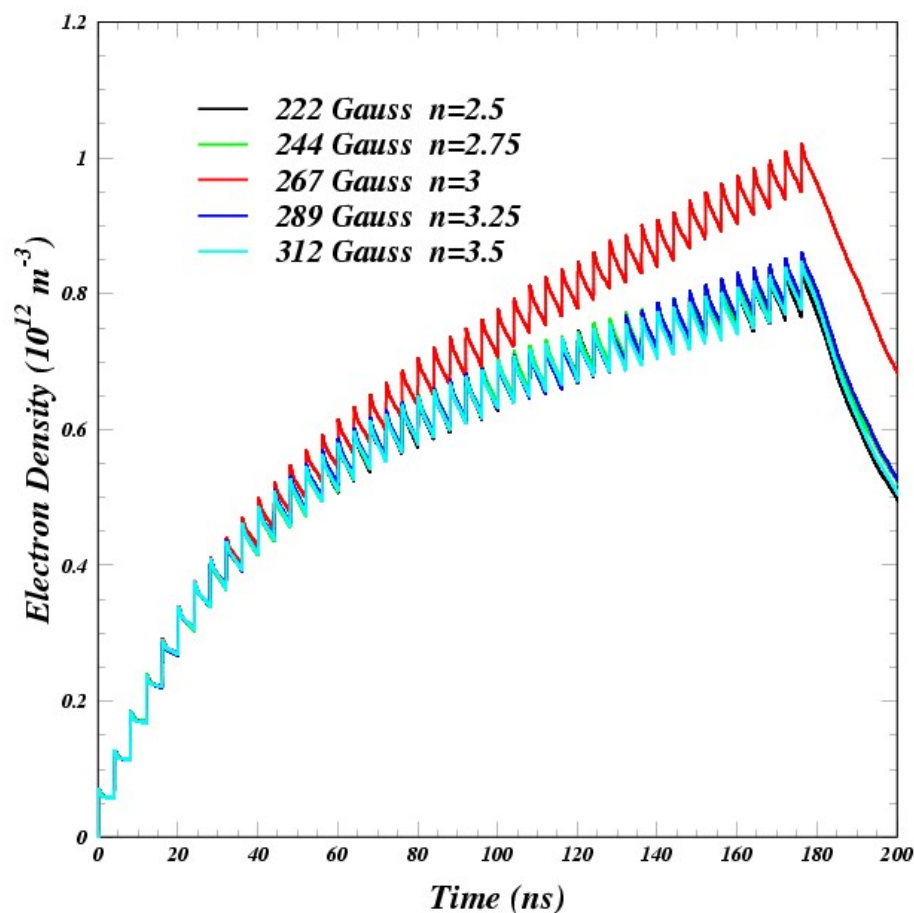
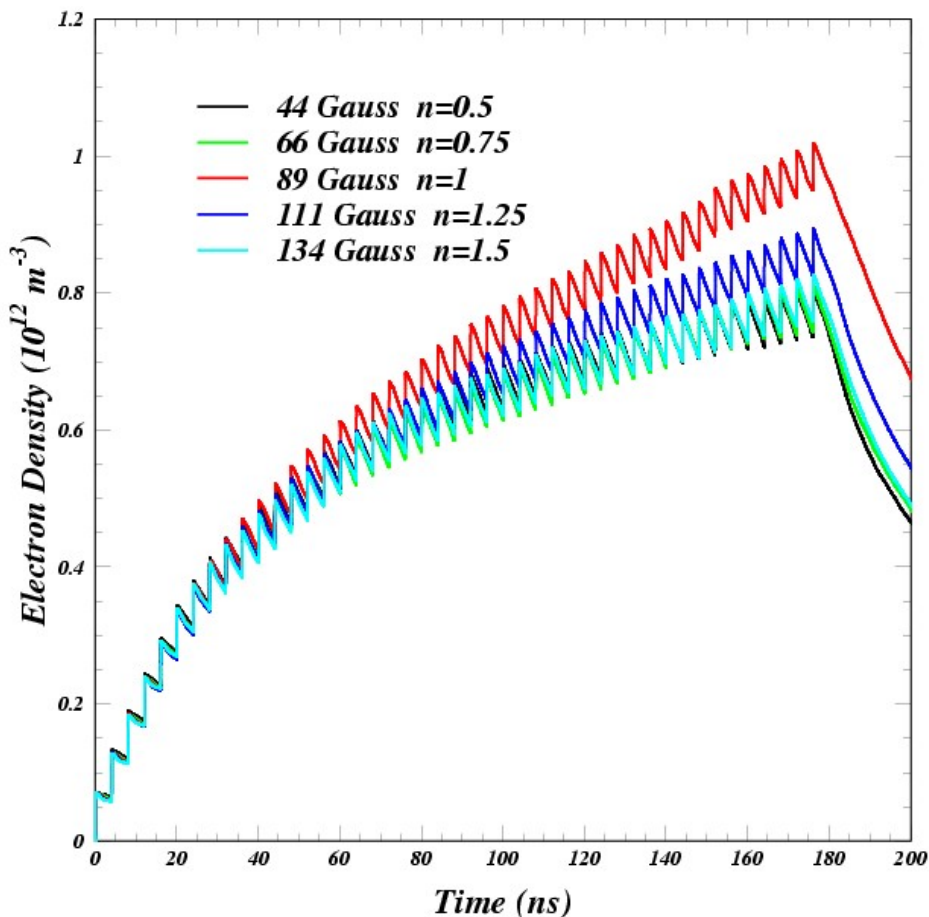
Reminder: POSINST modelling for PEP-II found narrow minima rather than maxima at n=1,3.

The cloud may not be reaching saturation for 4 ns spacing.



$$I_b = 2E10 \rightarrow 1E10 \text{ (1.25 mA} \rightarrow 0.625 \text{ mA)}$$

9 cm x 5 cm elliptical v.c. 0.025 p.e./e⁺ 100% reflectivity $\delta_{\max} = 1.4$ $E_{\text{peak}} = 310 \text{ eV}$ $I_b = 1E10 \text{ e}^+/\text{bunch (1.25 mA)}$



*Reducing the bunch charge may provide saturation at 4 ns spacing.
Resonant enhancement appears to remain.*