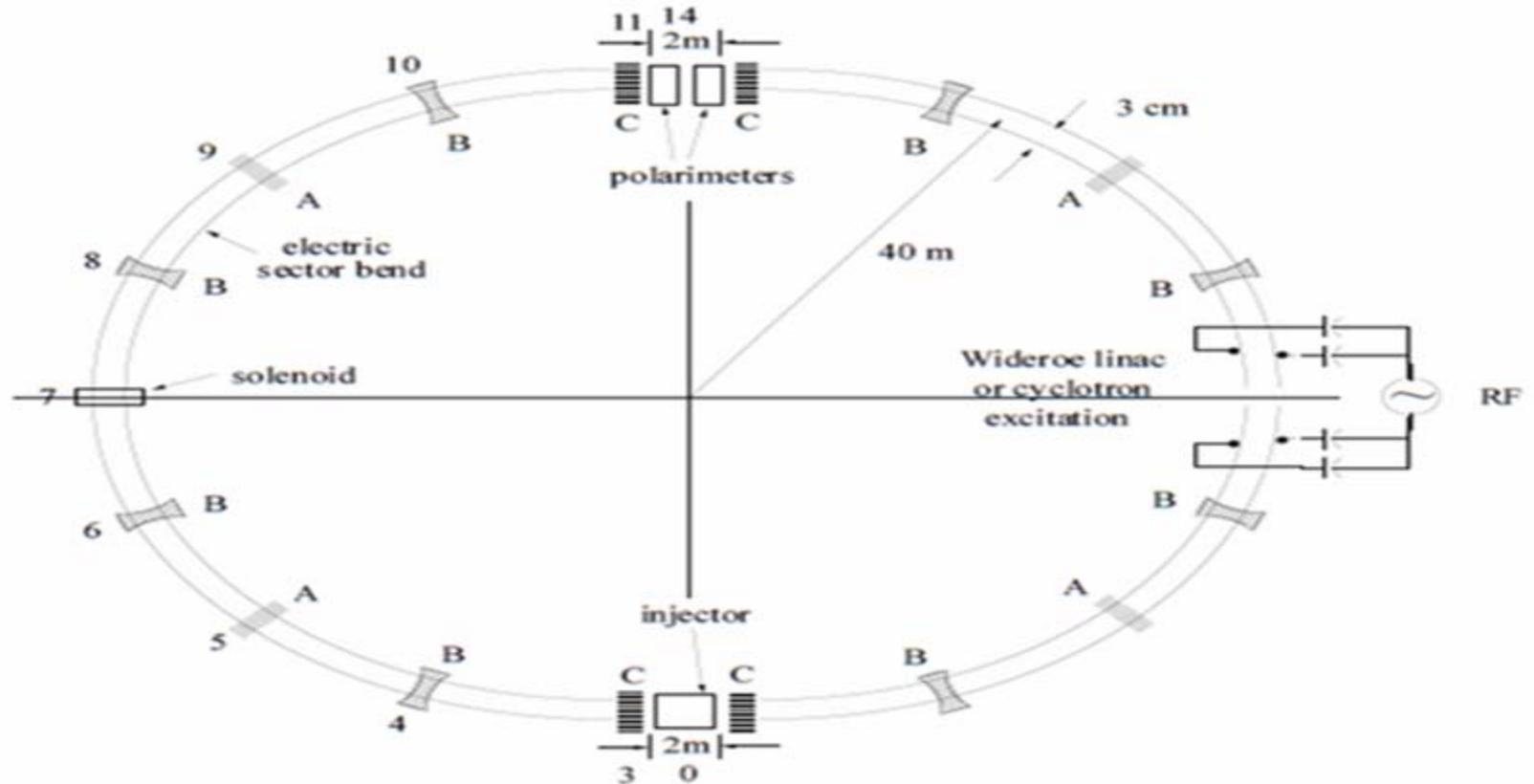


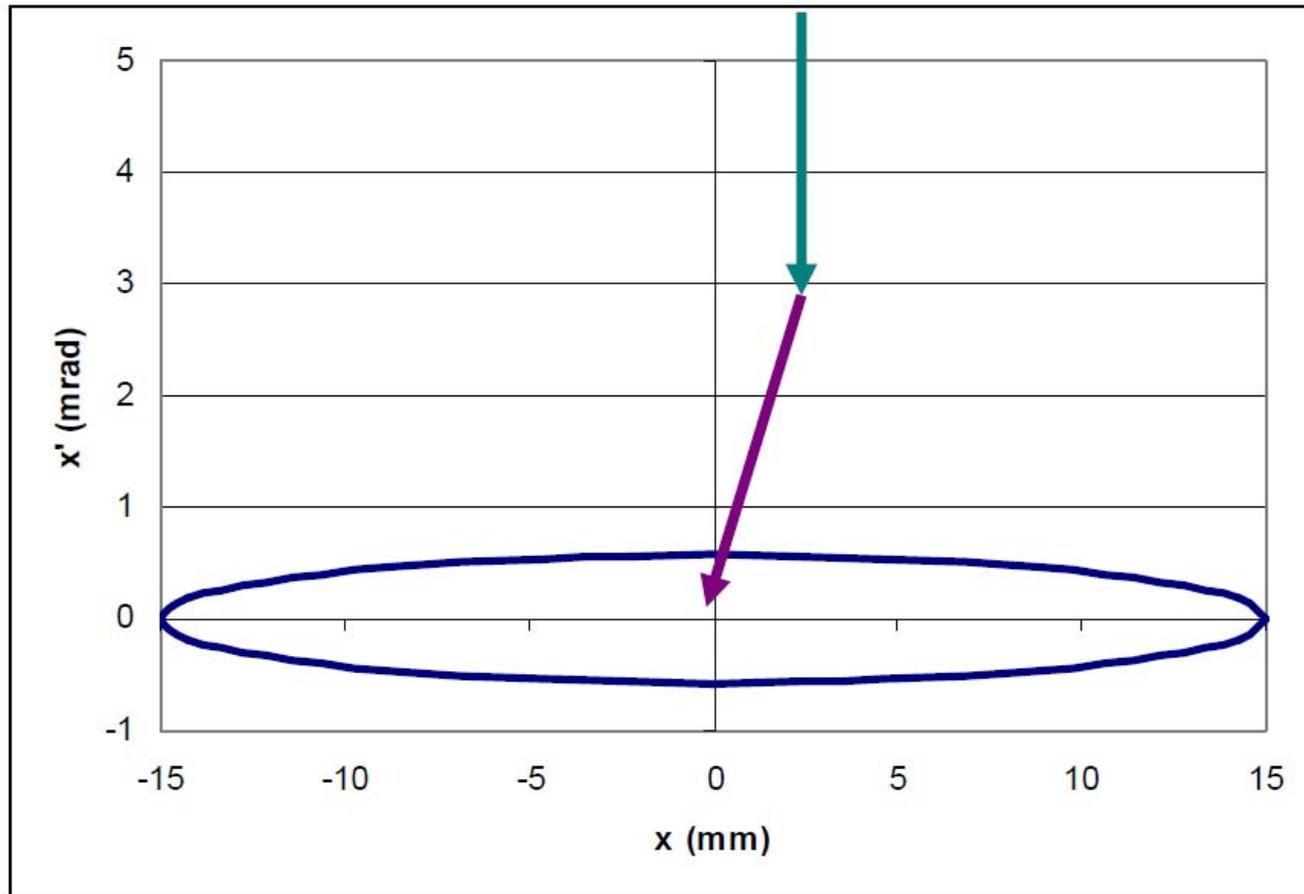
# Injection into the PEDM Ring

W. Morse

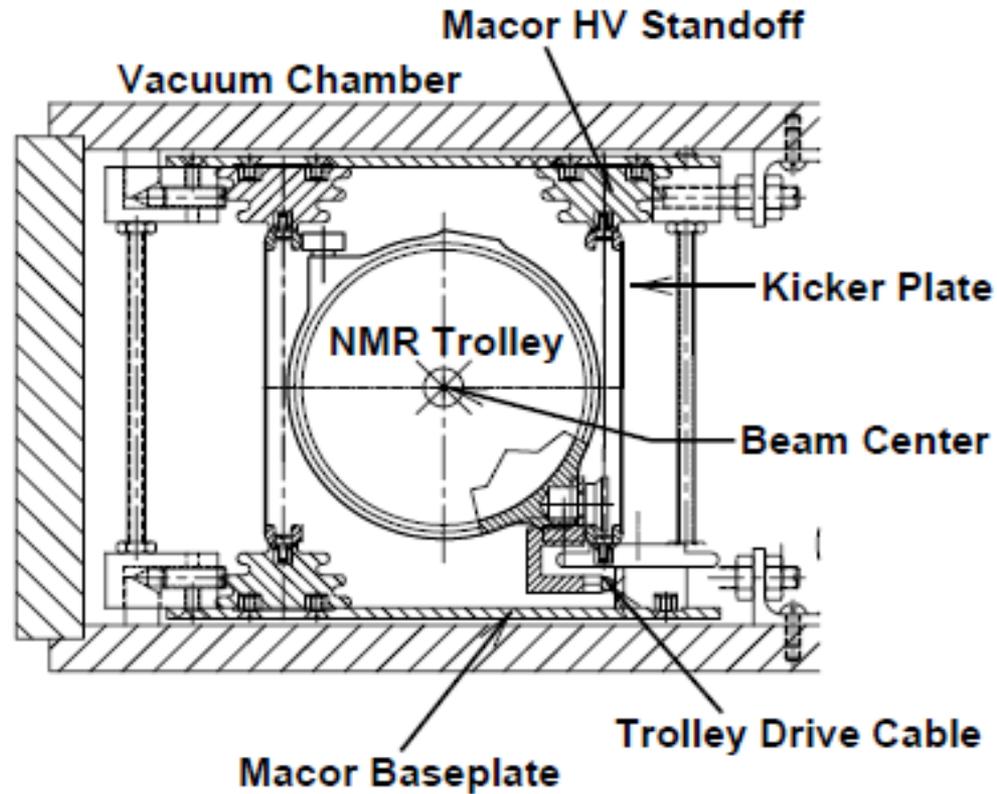
# 2m for injection – can we get enough kick?



Green is E821-type kick (90% in 2m).  
Maroon is Talman-type kick (10%).



# E821 No Ferrite Kicker Magnet



**E. Efsthadiadis et al., NIMA 496, 8 (2003)**

# Magnetic Kick

$$\frac{d\vec{p}}{dt} = ec\vec{\beta} \times \vec{B}$$

$$P_T = p\theta = eBL$$

# E821 kick vs. PEDM kick

<b>Parameter</b>	<b>E821</b>	<b>PEDM</b>	<b>R</b>
<b>P</b>	3.1 GeV/c	0.7 GeV/c	4.4
<b>L</b>	5.1 m	1.8 m	0.35
$\theta$	10 mrad	20 mrad	0.5
<b>W</b>	10 cm	5 cm	2
<b>H</b>	10 cm	10 cm	-
<b>rate</b>	30 Hz	1 Hz	-
<b>FWHM</b>	240 ns	240 ns	-
<b>Vac. Ch. I</b>	0.7	1	1.4
<b>Guesstimate</b>			<b>2.2</b>

# Frank Krienen Proposed E821 Electric Kicker

- Marx generator for PFN.
- Couldn't satisfy E821 30Hz requirement.
- Thyatron and step-up transformer.
- Not elegant.
- Marx generator is fine for PEDM.
- Frank assumed  $E = 5\text{MV/m}$  (before HPWR, etc.)

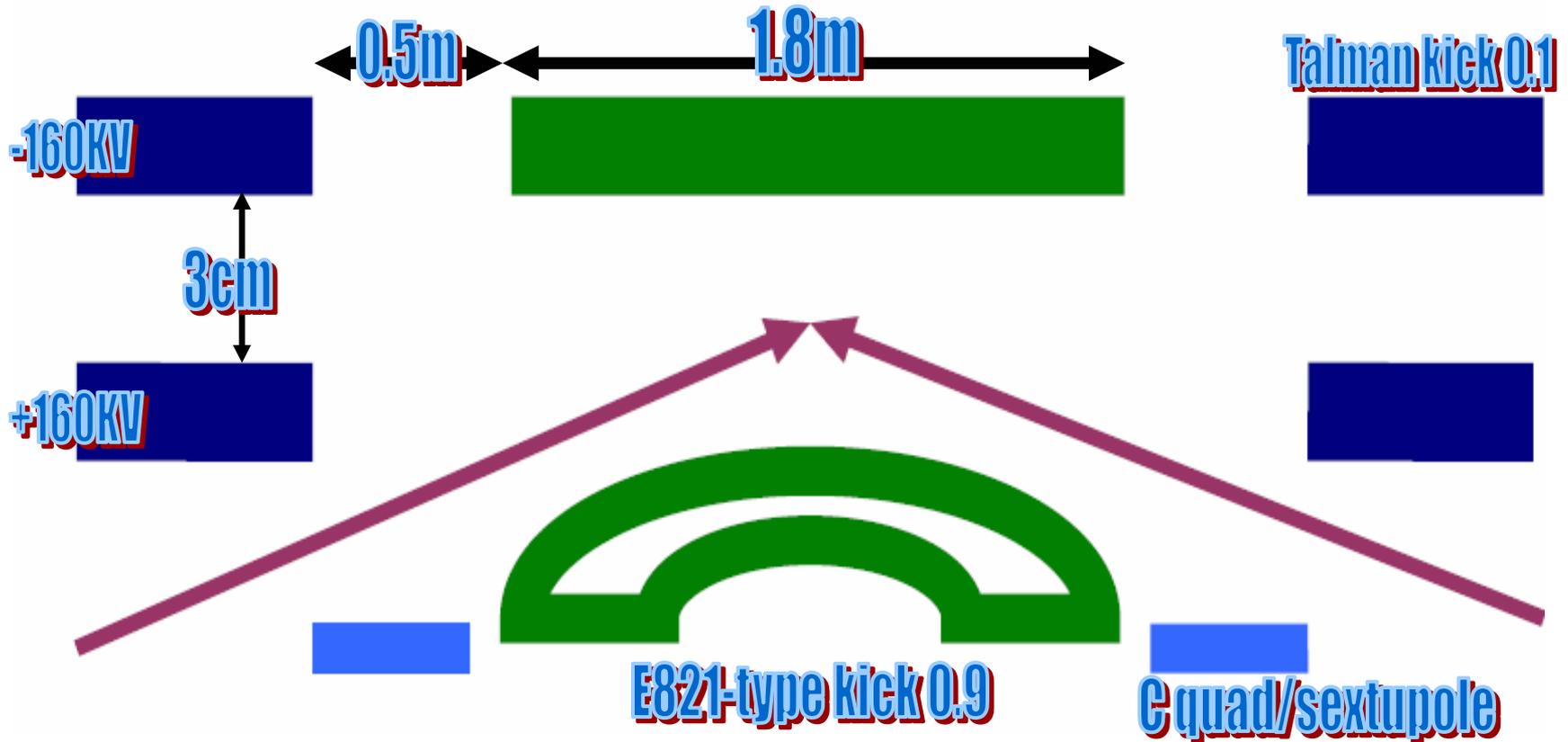
# Electric Kick

$$\frac{d\vec{p}}{dt} = e\vec{E}$$

$$P_T = p\theta = \frac{eEL}{c\beta}$$

**Gain  $1/0.6 = 1.4$**

# Cartoon – Not to Scale



# Conclusions

- Needs study.
- Frank Krienen type electric kicker may be the best.
- Needs study.
- We can't prove that 2m injection straight section isn't long enough,
- yet.