

Some arithmetic of flying wires at 150 GeV

S. Pordes 11/15/02

$$\begin{aligned}\sigma(E11H)^2 &\sim 0.40 [\text{emittance}] + 0.60 [\text{momentum spread}] \\ \sigma(E17)^2 &\sim 0.15 [\text{emittance}] + 0.85 [\text{momentum spread}]\end{aligned}$$

error from E17 will feed into emittance at E11

$$\begin{aligned}\text{emittance (150)} &= 16 \sigma(E11H)^2 - 5.7 \sigma(E17)^2 \\ (\text{typical}) &\quad (64) \quad - \quad (47)\end{aligned}$$

$$\begin{aligned}\sigma(E11H) &= 2 \text{ mm}, & \delta(\sigma(E11H)) &= 0.07 \text{ mm}, (3.5\%) \\ \sigma(E17) &= 2.85 \text{ mm} & \delta(\sigma(E17)) &= 0.1 \text{ mm} (3.5\%)\end{aligned}$$

$$\begin{aligned}\delta(\text{emittance}) &= \sqrt{(16 \cdot 4 \cdot 0.07)^2 + (5.7 \cdot 5.7 \cdot 0.1)^2} \\ &= 5.5 \quad (\text{out of } 17)\end{aligned}$$

looking at using SBD to derive momentum spread

really want somewhere with smaller momentum dispersion....

cf vertical

$$\text{emittance(150)} = 11.5 \sigma(E11V)^2$$

$$\sigma(E11V) = 1.3 \text{ mm} \quad \delta(\sigma(E11V)) = 0.03 \text{ mm}, (2.5\%)$$

$$\begin{aligned}\delta(\text{emittance}) &= 11.5 \cdot 0.08 \\ &= 1 \quad (\text{out of } 19)\end{aligned}$$

