

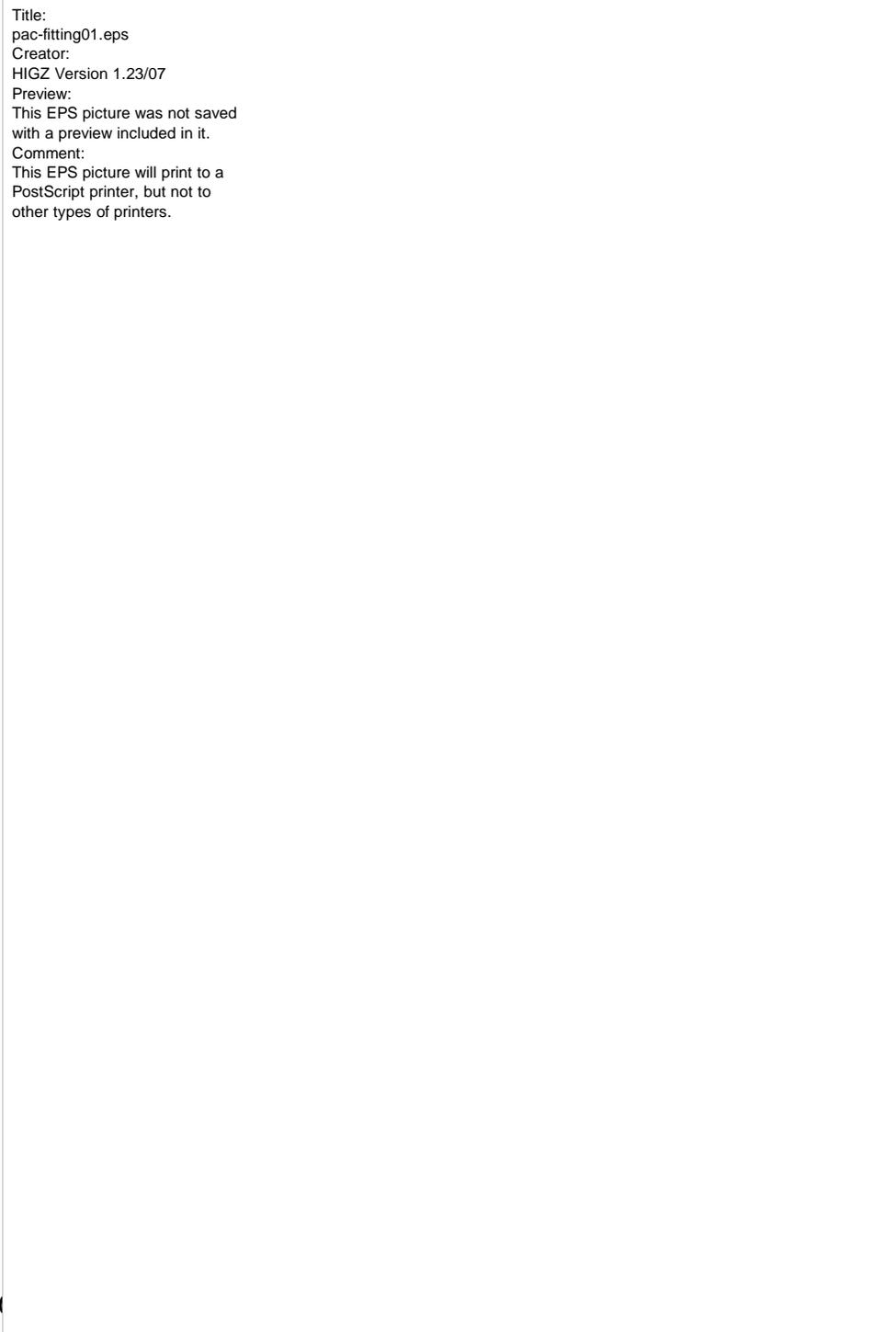
# SMT Road Widths & Extra CFT Layers

- Current Situation
- Adding a 3rd CFT layer
- Using all 8 CFT layers
- Summary

# Current Method

- Use **A, H layers** of CFT
  - Require sensitivity for
    - $|b| < 0.2$  cm
    - $|\kappa| < 0.002$  cm<sup>-1</sup> ( $p_T > 1.5$  GeV)
  - 2 hits only: Road width driven by IP range,  $|b| < 0.2$  cm
- Road width  **$\pm 2$  mm** (or  $\pm 1$  mm?)
  - **DÆ** Note 3363 (Uli)
  - Same width for all SMT layers

- See the following combinatoric scale



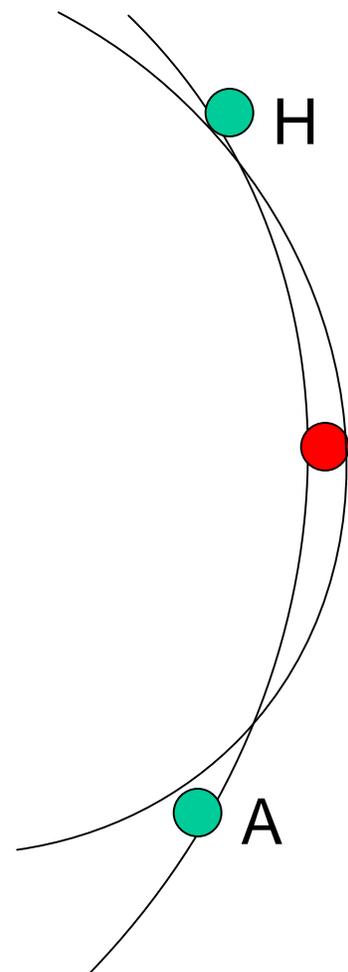
Title:  
pac-fitting01.eps  
Creator:  
HIGZ Version 1.23/07  
Preview:  
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with a preview included in it.  
Comment:  
This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

- And as a function of road width

Title:  
summary-zbb\_3int.eps  
Creator:  
HIGZ Version 1.23/07  
Preview:  
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with a preview included in it.  
Comment:  
This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

## Add a 3<sup>rd</sup> CFT Layer

- Vary track true  $b, \kappa$
- Find 3 fibers hit for  $b, \kappa$
- Bound road width
  - Try all 8 tracks touching edge of the 3 fibers (2 of 8 shown)
  - Only tracks meeting  $|b|$  and  $|\kappa|$  constraints
  - Plot  $\phi$  at each SMT radius (circular approx OK)
  - Keep  $\phi_{\text{MIN}}$   $\phi_{\text{MAX}}$   $\phi_{\text{TRUE}}$  for each layer
- Road:  $\delta\phi * r$



# Result: Road width vs. radius

Title:  
widths-noconstrain.eps  
Creator:  
HIGZ Version 1.23/09  
Preview:  
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with a preview included in it.  
Comment:  
This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

*Plot* is for *NO*  $|b| < 0.2 \text{ mm}$  constraint,  
with constraint, **ROAD** =  $\pm 2\text{mm}$

# Using all 8 CFT Doublets

- Choose true  $b$ ,  $\kappa$ ,  $\phi_0(=0.0)$
- Determine fibers hit
- Find widths for “all” tracks allowed by hit fibers (use random numbers)
- Plot width at each SMT layer

Title:  
all-summary.eps  
Creator:  
HIGZ Version 1.23/09  
Preview:  
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with a preview included in it.  
Comment:  
This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

# One example ( $b=\kappa=0$ )

Title:  
all.eps  
Creator:  
HIGZ Version 1.23/09  
Preview:  
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with a preview included in it.  
Comment:  
This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

Lightly shaded area:  
w/constraint  $|b| < 2$  mm

## Conclusions...

- Adding only a 3<sup>rd</sup> layer is little help
  - $|b| < 0.2\text{cm}$  still drives width
- Full information from 8 layers
  - Optimum road width, SMT layer dependent
  - Layer 4(outermost), Half width = 1 mm
  - Layer 1(innermost), Half width = 2 mm
- Impact of multiple scattering and CFT alignment precision unknown
- Make a few more sanity checks...
  - Fiber “resolution”: square w/width 1 mm
  - Simulate fiber bins?
  - Clear plot for 3 fiber case w/constraint