New COT pattern recognition approach

Patrizia Azzi, Paolo Gatti, Alberto Ribon
University of Padova & INFN

A. Yagil - *Fermilab*

history

- Idea first described in TDR Chapter 7.6.2 applied to the COT-Si linking in *r-z*
  - *study used Run1-type simulation & software*
- In 1998 implementation in the Run2 framework of the **COT-Si** ***r-z*** linking
  - *is now the default r-z silicon pattern recognition*
- **COT-Si** ***r-*** ϕ linking followed
- Generalization to **COT** ***r-*** ϕ only now also in place
  - *Subject of today's talk*
  - *Commissioning run approaching soon: focus on COT!*

strategy

- Start with a ***telescope***
  - *hint where a track should go*
  - *telescope = COT segment, COT track...*
- Define a search road
  - *really wide!*
- Search hits in each ***layer*** & make a histogram
  - *hits = COT hits, SI clusters*
  - *one histogram per layer (COT or Si)*
- Compute & plot ***F(T,hit)*** for each hit
  - *1-dim projection in the trajectory parameter space*
  - *each hit gives independent contribution*

strategy (cont’d)

- Sum histograms
  - histogram bin width affects the CPU time
- Find the position of the ***maximum***
  - not necessarly peaked at zero
- For each layer pick up the hit closest to the position of the maximum
- Done!
  - no need to fit multiple times --> fast