MC simulation
of the DIRC prototype

Outline

- Current status of the MC simulation of the DIRC prototype

- Assignment of direction cosines to each pad which Jerry uses in his analysis

Part 1

Current status of the MC simulation of the DIRC prototype

- The following features are included into the simulation:

Bars

- transmission coefficients (epotek, fused silica)
- refractive indices (epotek, fused silica)
- epotek between bars
- roughness of bars
- Reflection coefficient of mirror at the end of bar

Note : "Berkeley cookie" not included – no information available

Kamland oil & mirror

- transmission coefficient of oil
- refractive index of oil
- mirror reflection coefficient

PMT's

- Quantum efficiency of PMT's
- Relative efficiency of each pad determined from scanning setup and dependent on position within MCP
- Simulation of charge sharing:

  when a photon hits between two pads => both pads register this photon

Conclusion

- Most features of DIRC prototype have been added into the program

Part 2

Assignment of direction cosines (kx,ky, kz) to pads

Two different approaches

1) "Fixed lambda" assignment

2) "Variable lambda" assignment

"Fixed lambda" assignment

- Photons were emitted isotropically from beam position 1 with fixed wavelength (λ=410 nm)

- Photons were detected in PMT's

- I took into account only photons detected close to the center of each pad and assigned direction cosines from the mean values of these photons
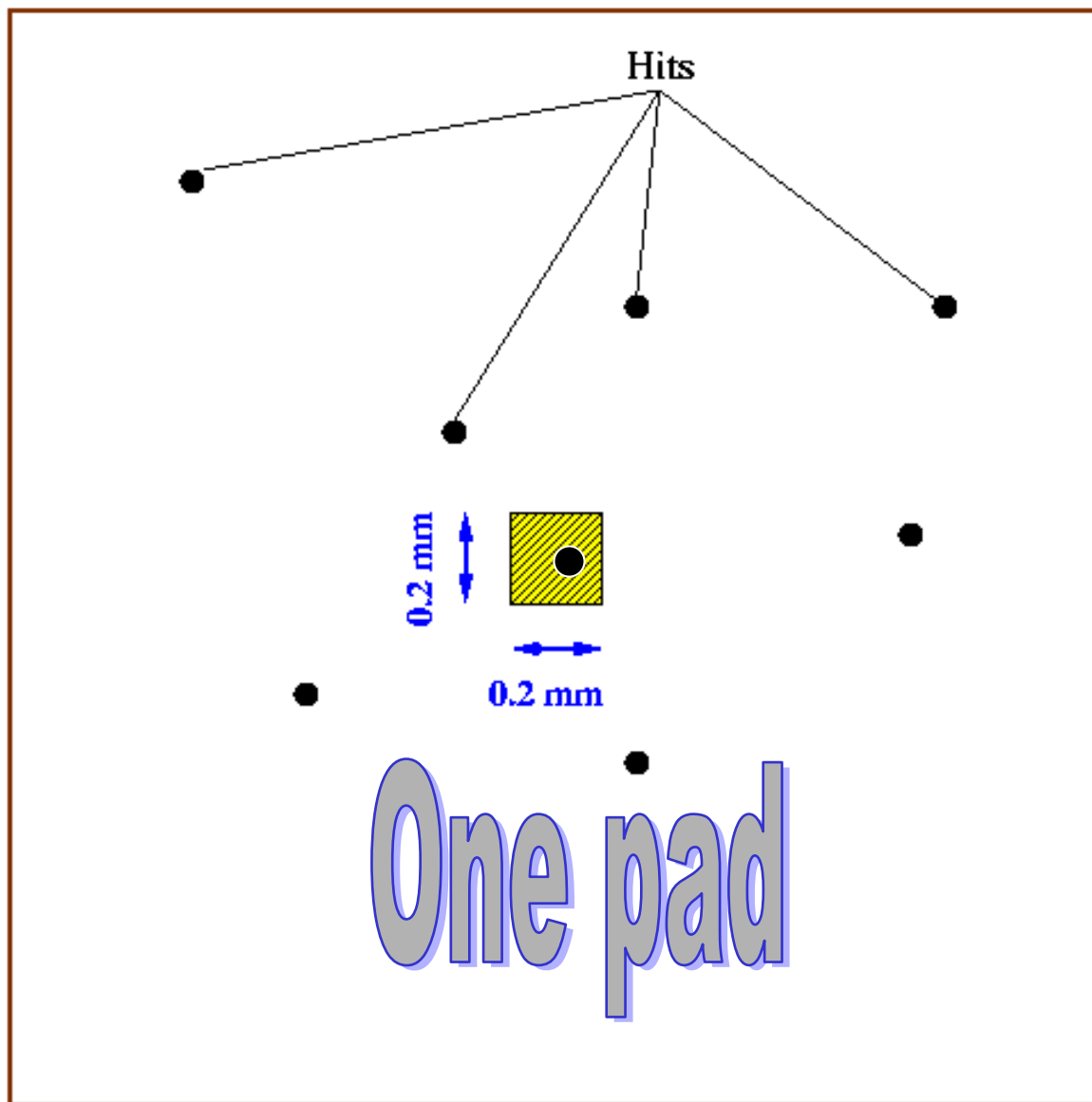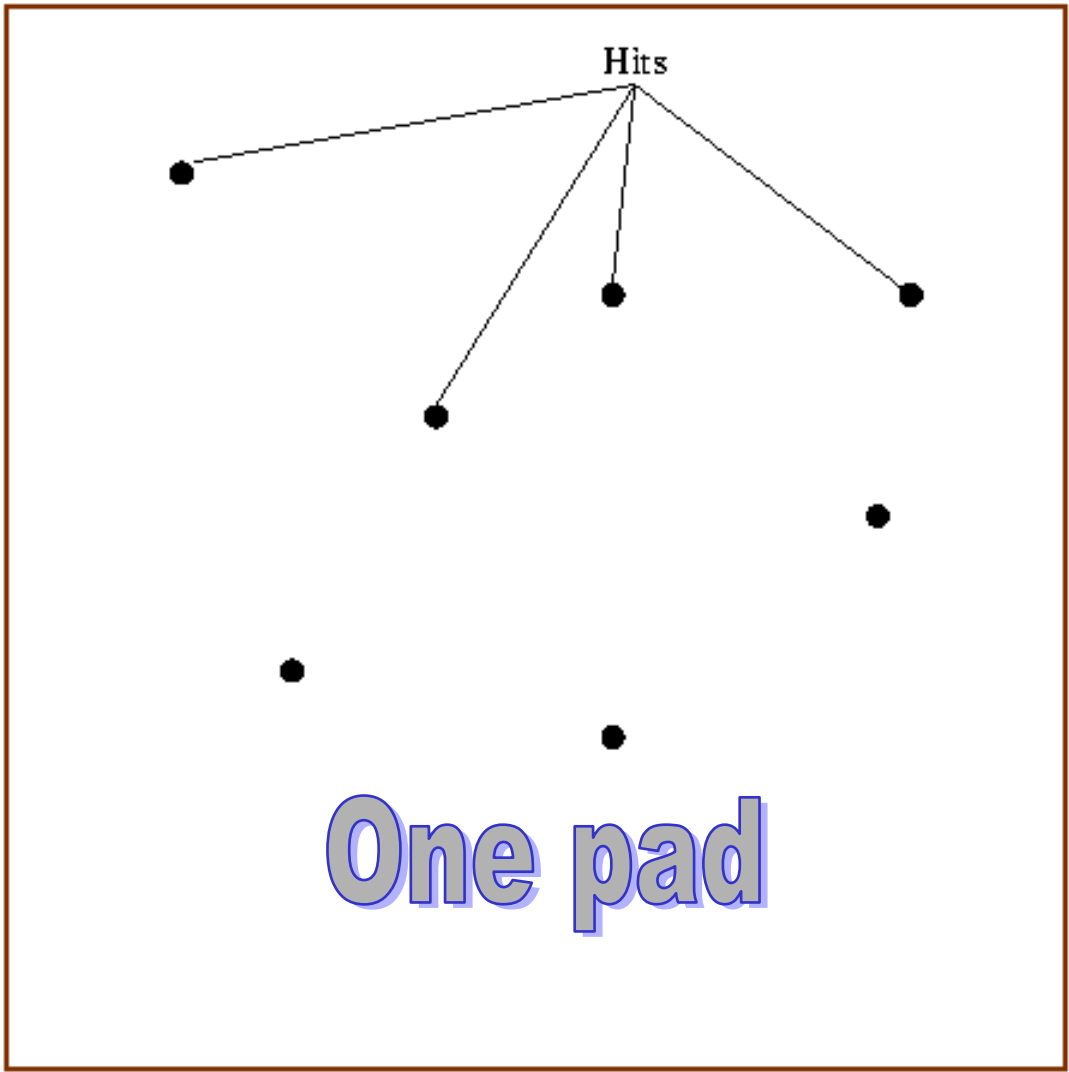
"Variable lambda" assignment

- 10 GeV electron was shot into bar at beam position 1
- Photons were detected in PMT's
- I took into account all photons in each pad and assigned mean values from these photons

Thank you for your attention