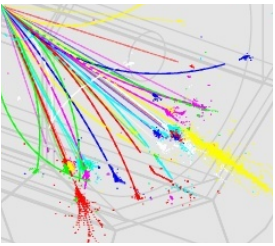


# **CALICE-UK MAPS**

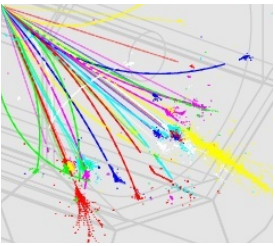
## **Who we are and we are doing**

***SiD Meeting 01/June/2007***



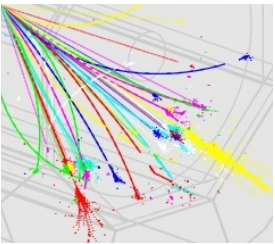
# The Institutes

- University of Birmingham
  - Y. Mikami, O. Miller, V. Rajovic, N.K. Watson, J.A. Wilson
- Imperial College, London
  - J.A. Ballin, P.D. Dauncey, A.-M. Magnan, M. Noy
- Rutherford Appleton Laboratory (PPD and ID)
  - J.P. Crooks, M. Stanitzki, K.D. Stefanov, R. Turchetta, M. Tyndel, E.G. Villani
- 7 staff, 2 post-docs, 2 students , 2 chip designers and 2 engineers



# Resources

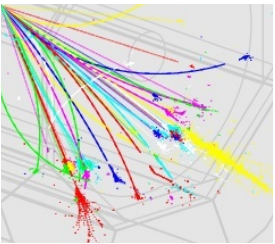
- Large clean room facility
  - Silicon assembly
  - Probe stations
  - Laser test stand
  - Cosmics & Sources set-up
- Computing (GridPP)
- Secured funding until 2009, expect extension
- Electronics and technical workshops



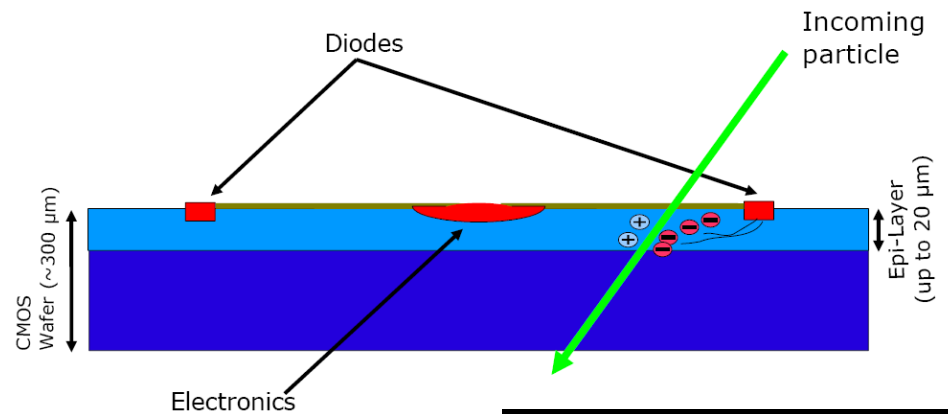
# Digital EM Calorimetry

- Digital Calorimeters count shower particle
  - Works with small pixel sizes (Single Hit occupancy)
  - Pixel Size of 50 x 50  $\mu\text{m}$  good choice for EM
- Need large area of pixels
  - Can't use LHC style hybrid pixels
  - Usage of MAPS instead
- Does this work with PFA ?
  - Yes, e.g. PandoraPFA has digital hit support

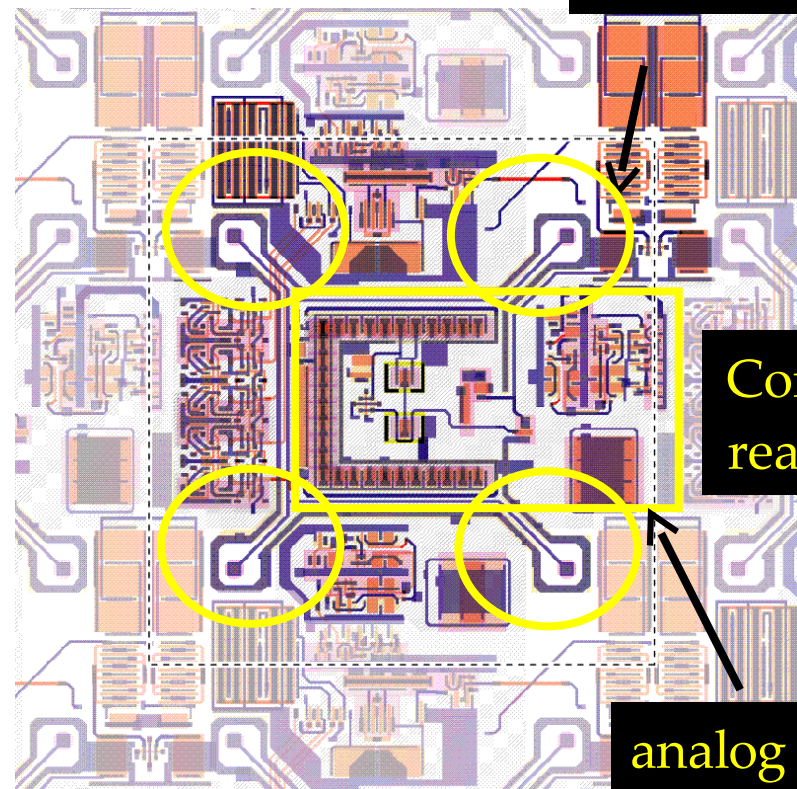
# What are MAPS ?



- **M**onolithic **A**ctive **P**ixel **S**ensors
- Integration of sensor and electronics
- Charge Collection by Diffusion
- Can be made using CMOS technology
- We use the INMAPS process with a deep p-well



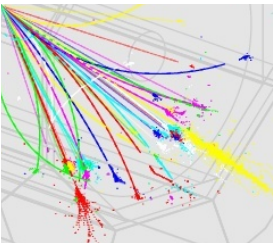
4 diodes  $\varnothing$  1.8  $\mu$ m



Comparator+  
readout logic

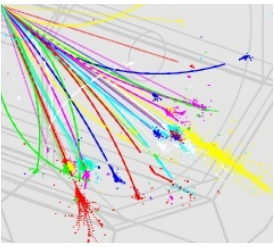
analog circuitry.





# The current Program

- Sensor design of a MAPS for EM calorimetry
  - Two iterations funded
  - First prototype back End of June
  - Extensive testing this summer
- DAQ for a MAPS sensor
- Simulations
  - Sensor level simulations with Sentaurus
  - Detector simulations with Geant
  - Started working on PFA for MAPS



# Our interests

- SiW EM calorimeters for ILC
- Exploit MAPS technology for digital calorimetry
- Detector simulation & Particle Flow
- Detector optimization/benchmarking
- Physics studies