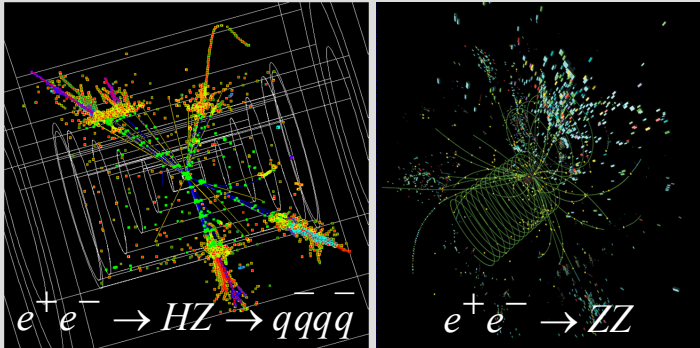




A MAPS readout sensor for the CALICE ECAL

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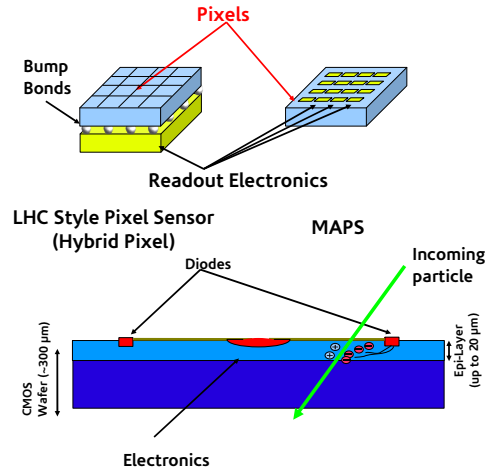
CALICE : Calorimeter R&D at the ILC



- Physics at ILC involves a lot of multi-jet final states
- This requires excellent Energy Resolution
- Particle Flow Algorithms can achieve this resolution
 - By combining Tracking and Calorimetry
 - High spatial resolution required
- The CALICE collaboration proposes a highly granular SiW Electromagnetic Calorimeter for Particle Flow reconstruction

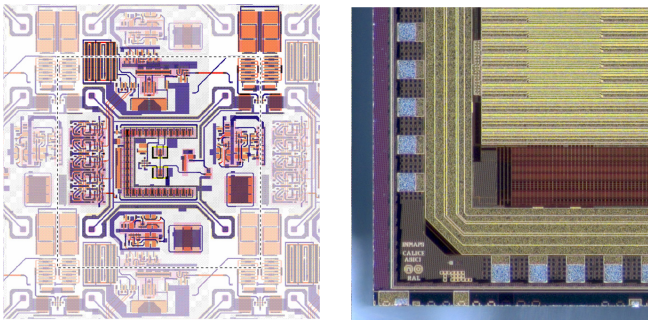
What are MAPS ?

Monolithic Active Pixel Sensors are a new technology for particle detection



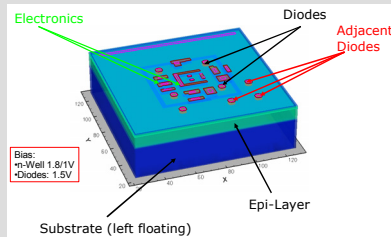
- MAPS sensors integrate active area and readout electronics
- MAPS are manufactured using a industry standard CMOS process
- Charge is only collected by diffusion

CALICE ASIC1

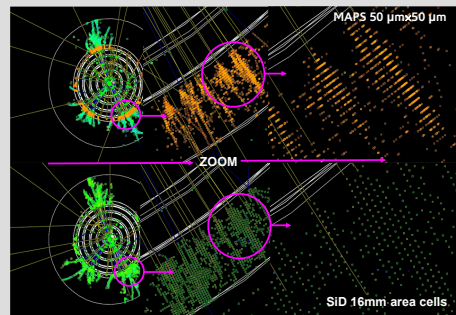


- First generation made in 0.18 μm CMOS process
- Using the novel INMAPS process pioneered by RAL
- Integrated Readout electronics
 - 4 readout diodes
 - 1 Bit ADC (binary readout)
 - 13 Bit Timestamp per Hit
 - Hit buffering for duration of bunch train
- ASIC1 has 168x168 pixels and 6 million transistors
- ASIC 1 has been recently delivered to RAL

Simulation



- Sensor simulation using industry-proven packages
- Study charge collection efficiency
- Study noise behavior
- Optimizing sensor design



- Physics studies to test benefits of digital calorimetry
- Done for both Detector Concepts
 - SiD
 - GLDC
- Work on Particle Flow Algorithms