

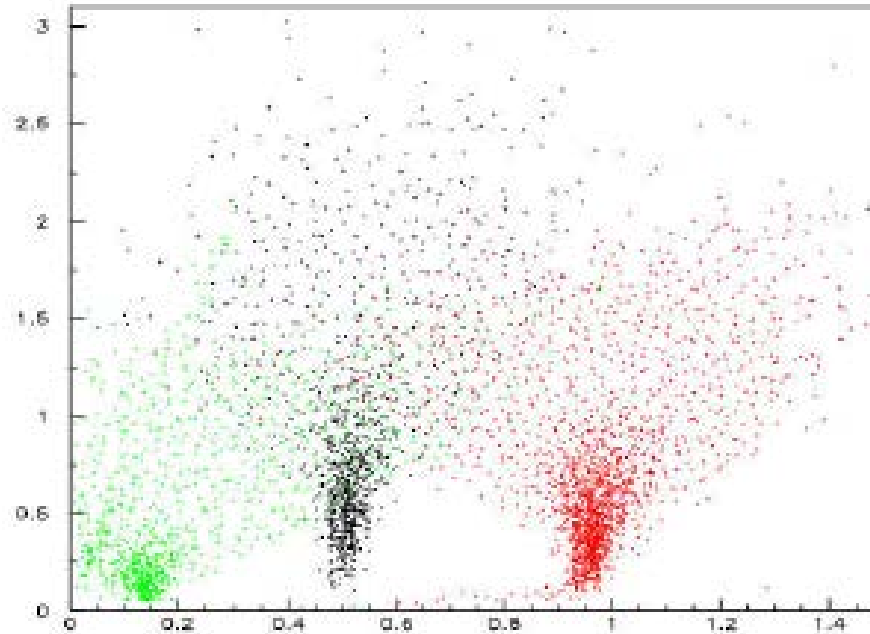
Fast readout for ECAL SiPM

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outline

- Physics motivation
- Fast SiPM
- SiPM Readout solution
- Data Transmission Channel
- Pixel detector development

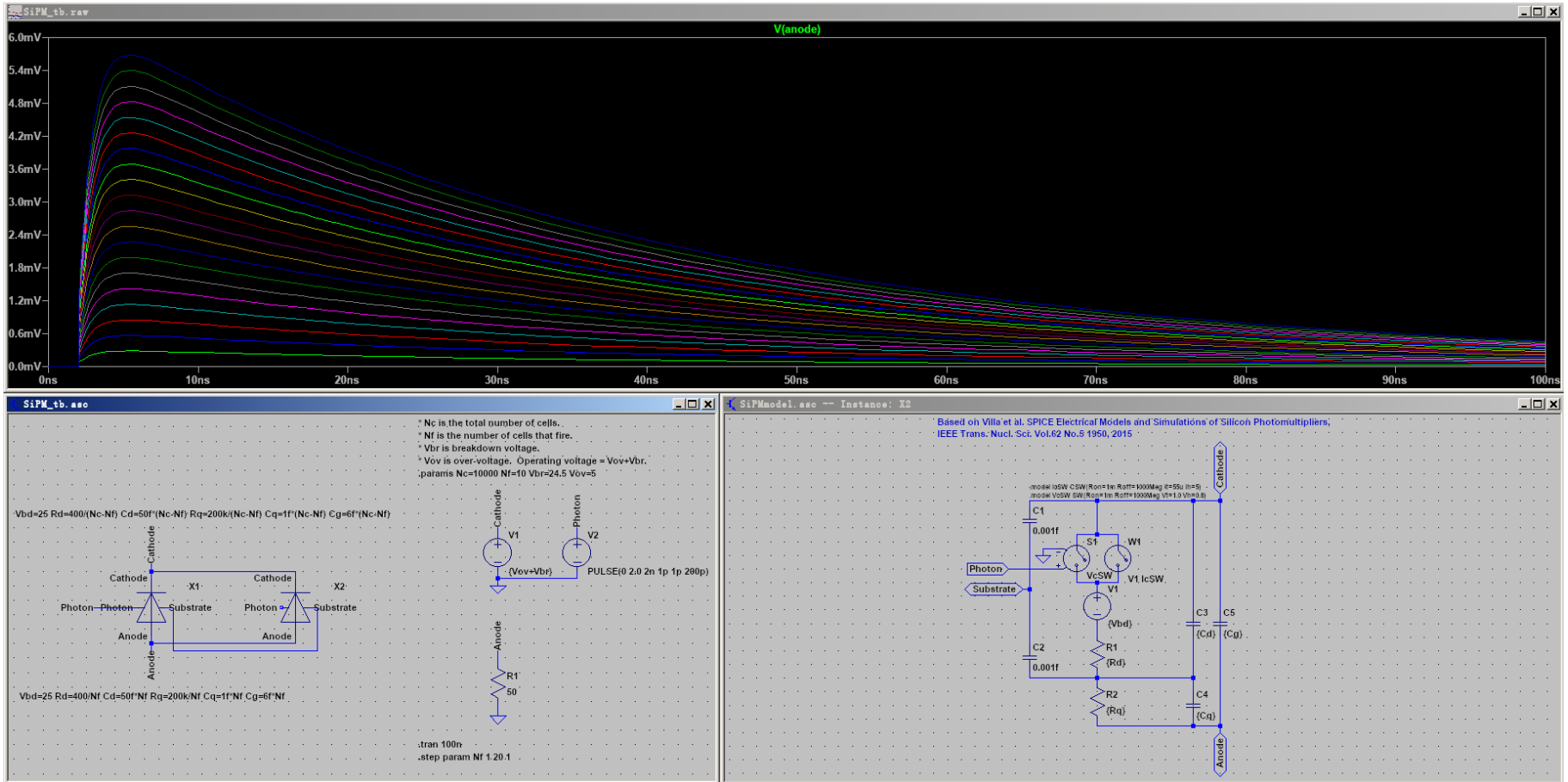
Physics motivation



Particle momentum V.S. time (ns)

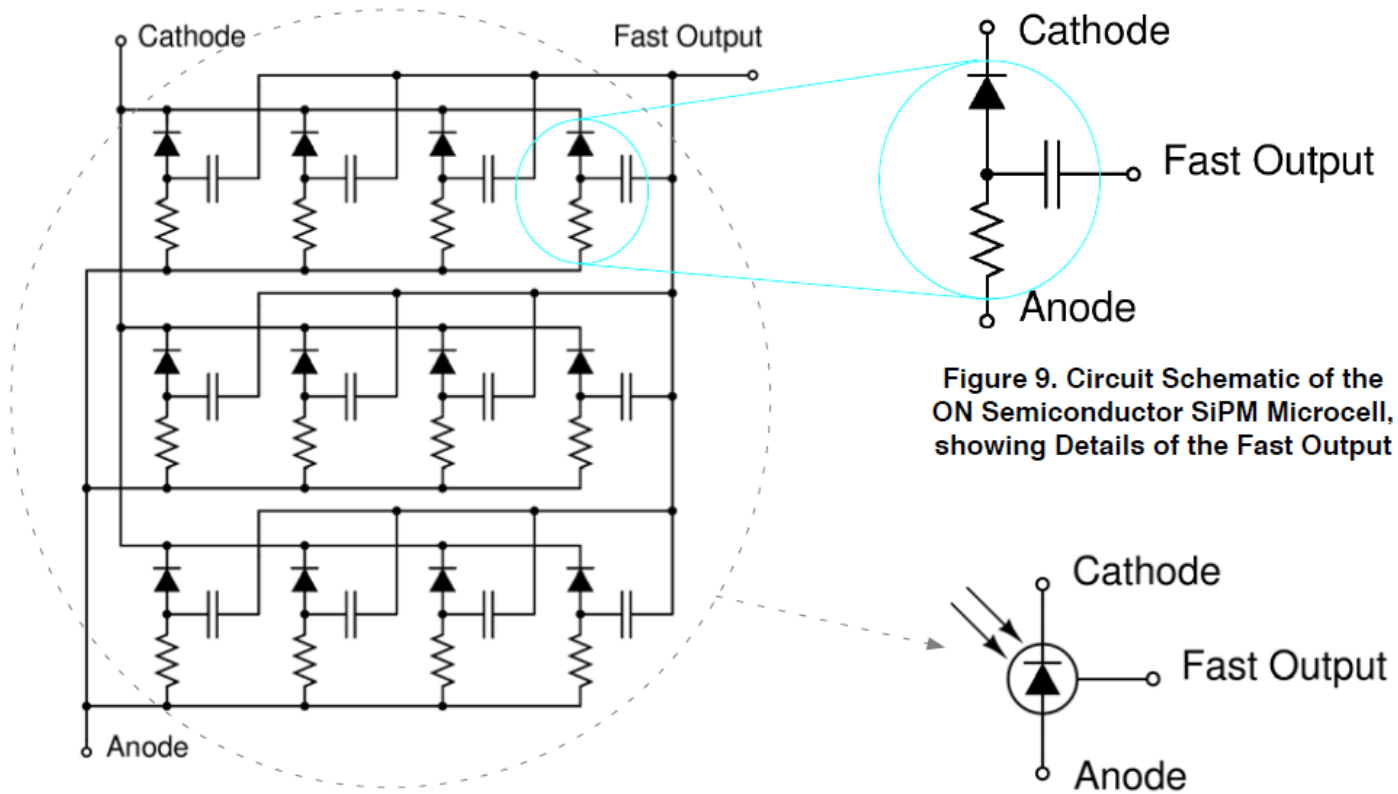
- 100ps time resolution helps particle identification
- Current system is 400ps

SiPM



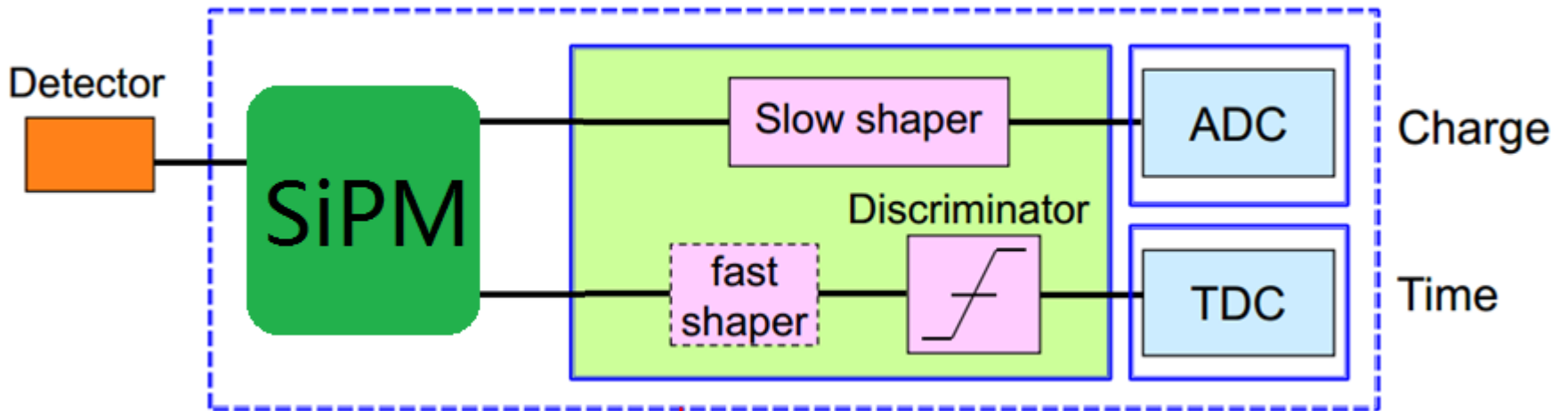
- Rising time is less than 10 ns

Fast SiPM



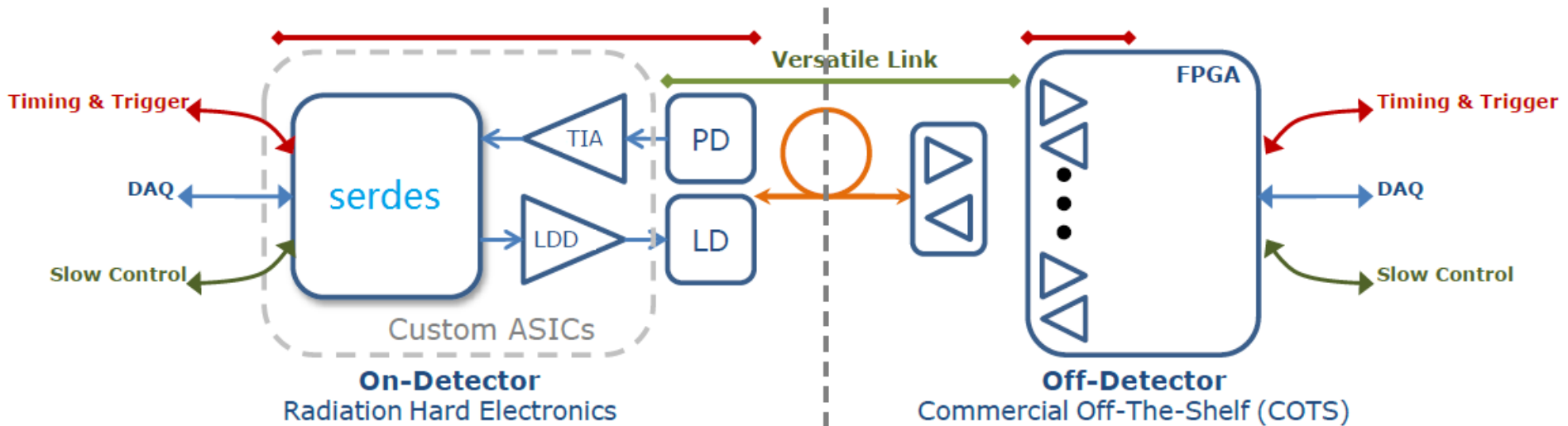
- www.onsemi.com J-Series SiPM Sensors
- Rising time :90-250ps

SiPM Readout solution



- 32 channels
- TDC resolution 100ps
- ADC 10MHz

Data Transmission Channel



- either be integrated as IP or separated ASIC
- DTC can be used for other detector between FEE and FPGA

Pixel detector development

- Smaller feature size 130nm CMOS
- High resistivity wafer
- 4 well and adjustable process
- Design and test of pixel sensor
- Assembly and production of detector
- Prototype / deliver a fraction of IT