

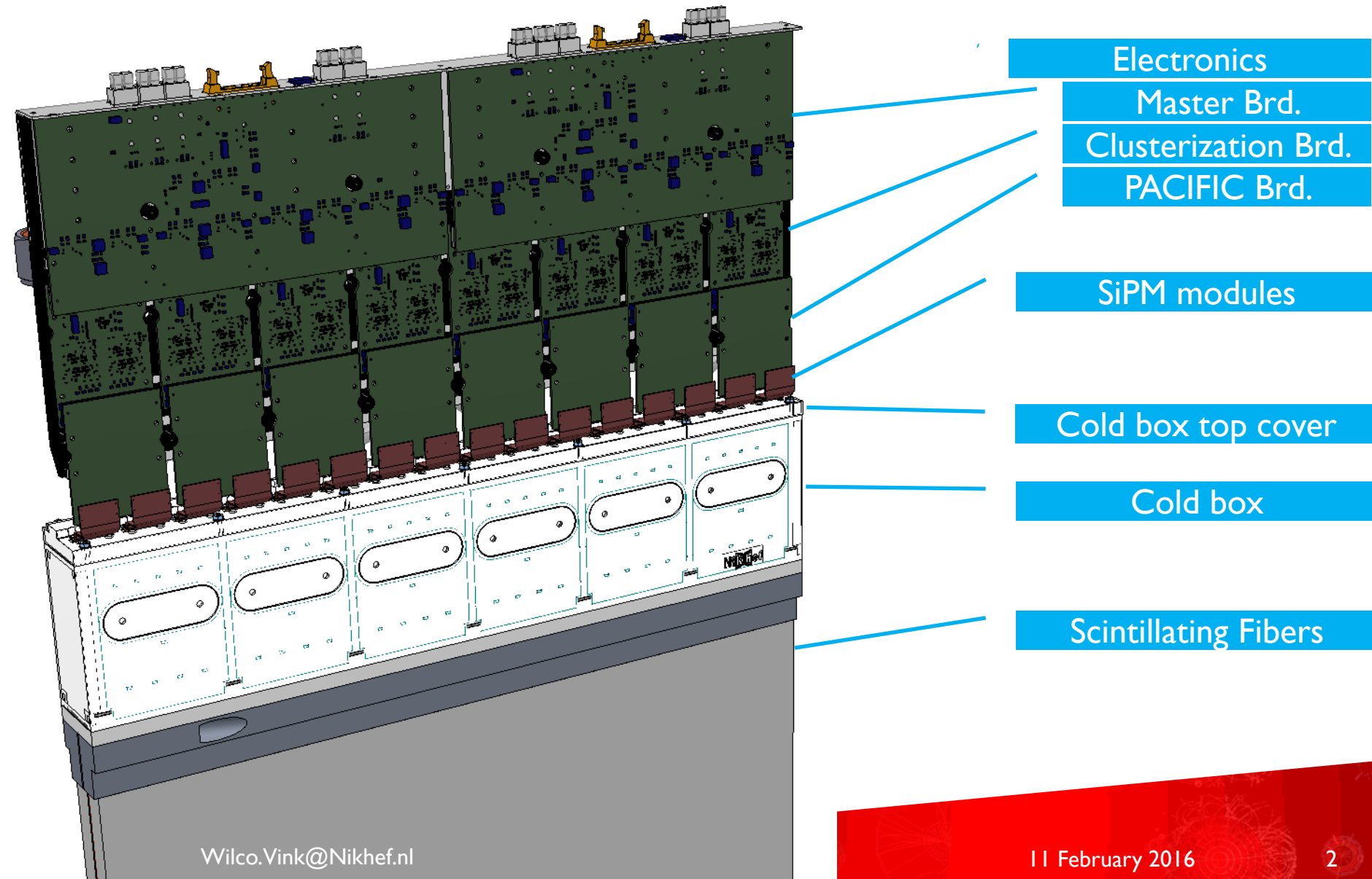
IGLOO2 FPGAs in the SciFi detector

LHCb Upgrade electronics meeting

11 February 2016

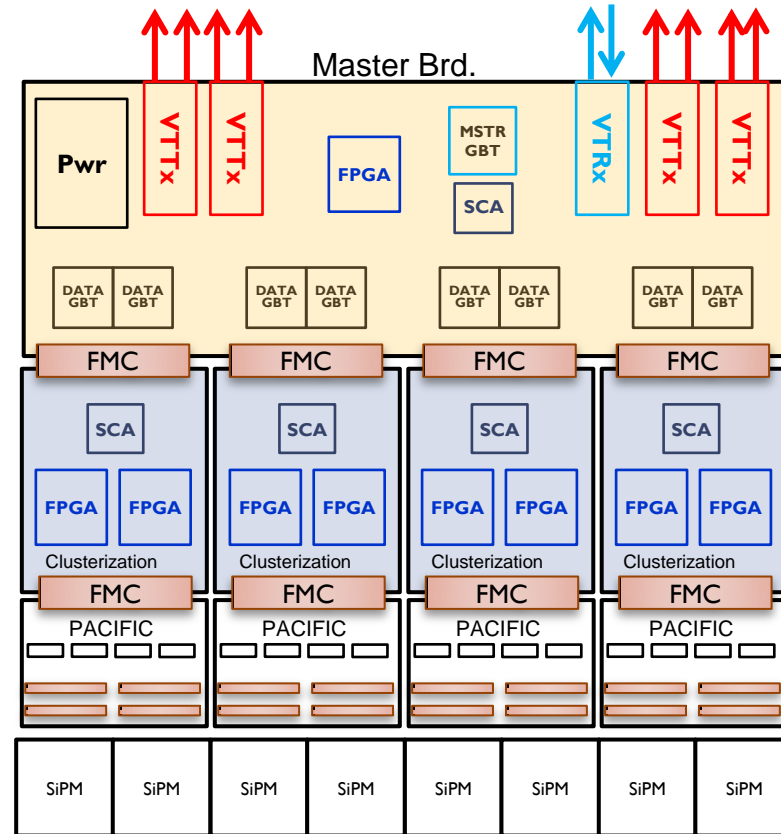
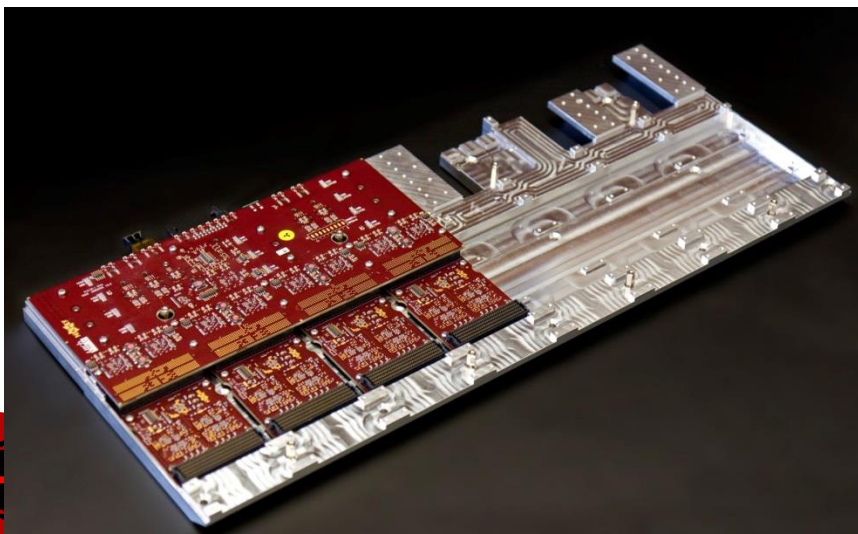
Wilco Vink

SciFi Read Out Box (ROB)



IGLOO2 FPGAs in SciFi

- Master Board
 - Small IGLOO2 for Light injection calibration system and housekeeping
 - Type TBD, probably: M2GL005-VF256
 - Total in SciFi: 576
- Clusterization Board
 - Clustering FPGAs
 - IGLOO2 M2GL090-FGG484
 - Total in SciFi : 4608



Radiation level at front end electronics

- The Tracker TDR states(in Sec. 3.2.3)
 - "The integrated ionising dose in the SiPMs is 40 Gy in T1 and **80 Gy** in T3."
- We believe our FPGA should be able to go up to 300 Gy
- Whether this is good enough needs to be decided

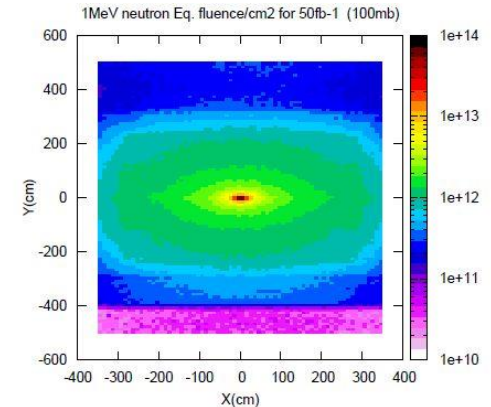


Figure 3.1: The expected 1-MeV neutron equivalent fluence per cm^2 at $z = 783$ cm after an integrated luminosity of 50 fb^{-1} .

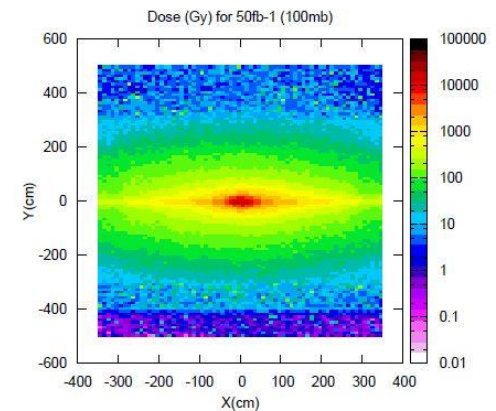


Figure 3.2: The expected dose in the $x - y$ plane at $z = 783$ cm after an integrated luminosity of 50 fb^{-1} .

Radiation Tests

- General specs:
 - Max bitrate 160Mb/s
 - Max Frequency 80 MHz
- FPGA recourses used which needs attention with respect to radiation tests
 - Delay paths in clusterization algorithm,
 - DDRio blocks
 - On Die Termination (ODT)
- SciFi very interested in cooperation for radiation tests.