

Results on diamond timing detector for the TOTEM experiment



Edoardo Bossini on Behalf of the TOTEM Collaboration

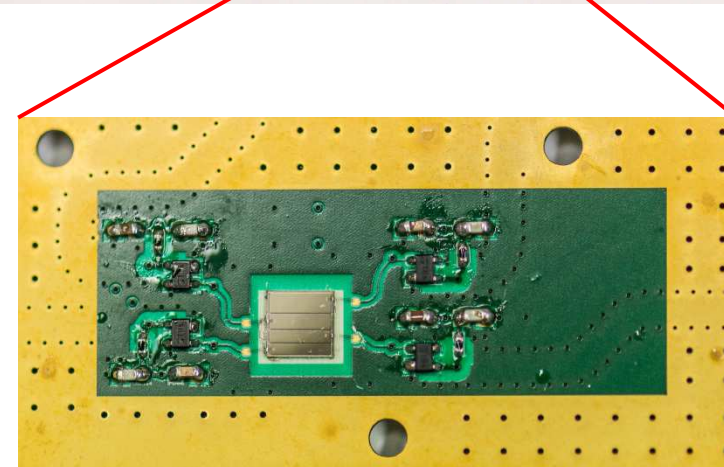
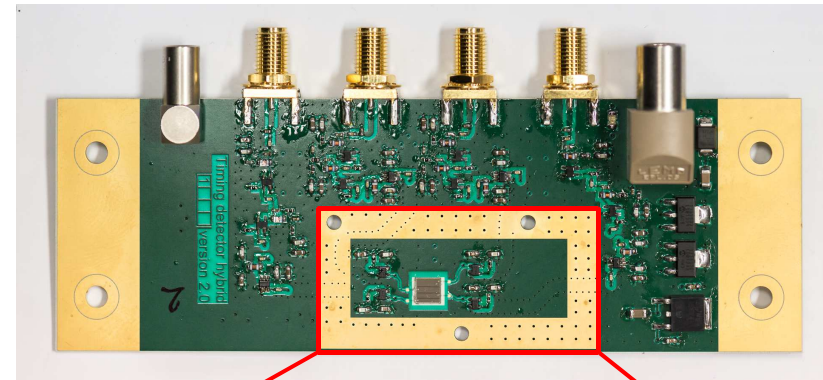
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TOTEM experiment will extend his physics program during LHC Run II. To disentangle pile-up events development of TOF detector with timing resolution <100 ps is needed. Diamond detectors has been chosen and tested.

The poster will present the results obtained with commercial solutions , which showed unsatisfactory performances.

A new hybrid board board has thus been developed:

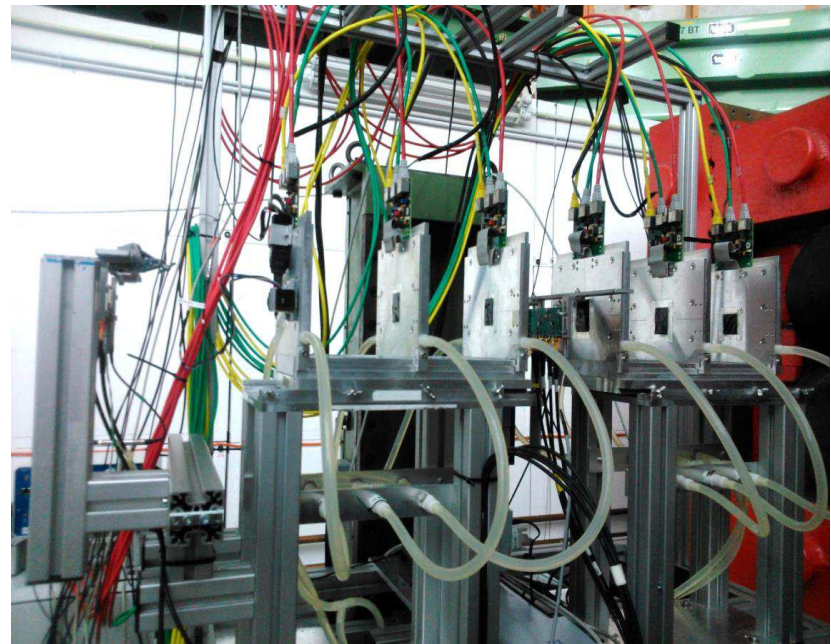
- 4 independent channel
- Full amplification chain integrated
- Can host 1 Diamond metallized with up to 4 pixel/strip
- Pre-amplifier at ~ 1 cm from the diamond
- Core area can be shielded with special aluminum boxes



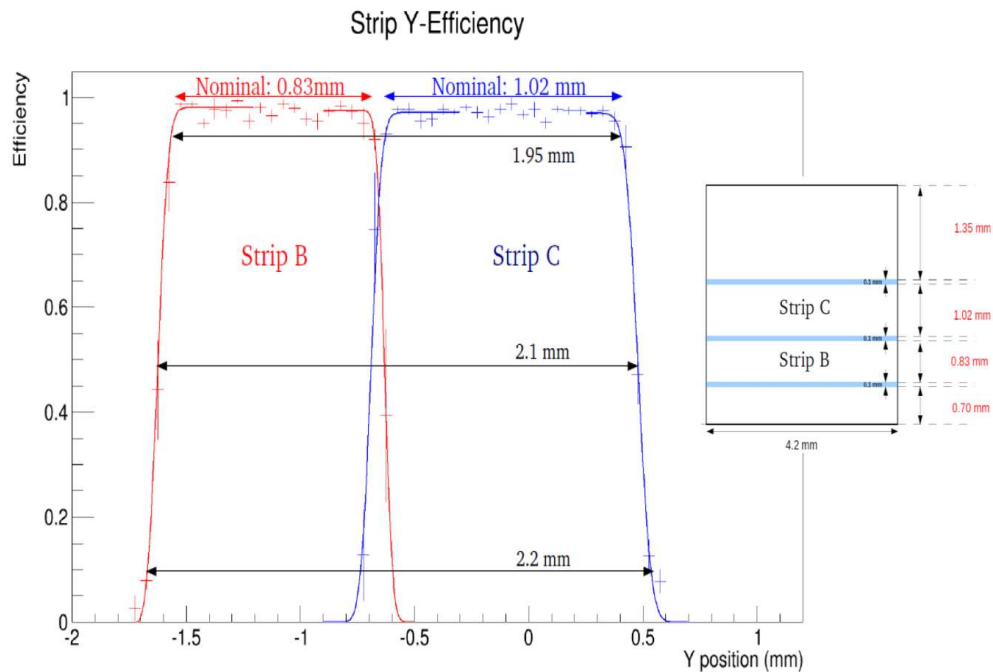
Board prototype

First results have been obtained at SPS (CERN), and confirmed during test-beams at DESY (Hamburg).

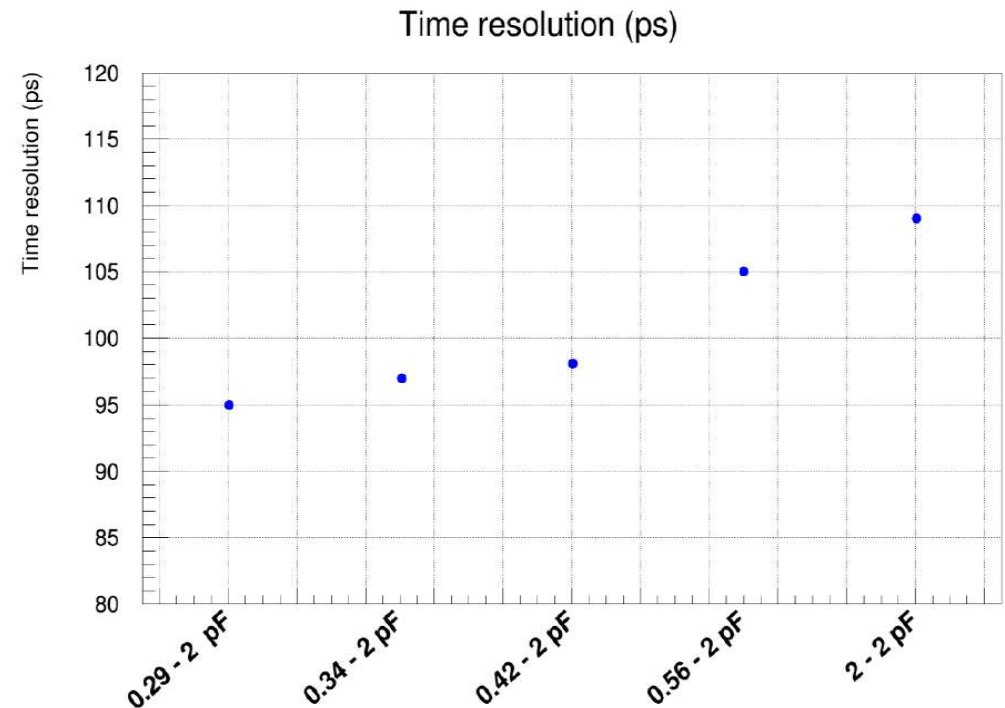
Relation between timing performance and strip area (=capacitance) has been investigated as well detector efficiency, using the DATURA tracker available in DESY beam line.



Setup for DESY test-beams.



Strip efficiency using DATURA tracker.



Detector timing performance wrt strip capacitance