

**IN**telligent, **F**ast, **I**nterconnected and **E**fficient devices, for frontier exploitation in **R**esearch and **I**ndustry

Funding Scheme: FP7-PEOPLE-2012-ITN

Grant Agreement number: 317446

Project acronym: INFIERI



**DELIVERABLE NAME:** *High Speed Links Evaluation and Test Results*

**DELIVERABLE REF. N°:** 3.5

**WORK PACKAGE:** 3

**NATURE OF THE DELIVERABLE:**  P = Prototype,  D = Demonstrator

**BENEFICIARY(IES) CONTRIBUTOR(S):** FOM, CERN

**AUTHOR(S) NAME(S) & EMAIL(S):** *Antonio Pellegrino <antonio@nikhef.nl>*

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**DELIVERY DATE FROM ANNEX 1:** 48

**DISSEMINATION LEVEL:** RE

**PU** = Public N/A IN THE INFIERI CONTEXT

**PP** = Restricted to other programme participants (including the Commission Services) N/A IN THE INFIERI CONTEXT

**RE** = Restricted to a group specified by the consortium (including the Commission Services) **HIGHLY SUGGESTED IN THE INFIERI CONTEXT**

**CO** = Confidential, only for members of the consortium (including the Commission Services) **HIGHLY SUGGESTED IN THE INFIERI CONTEXT**

### **Abstract:**

We designed, realized and commissioned high-bandwidth electronics for usage in the LHCb experiment at the LHC, in particular fast serializers and transmitters usable in radiation areas. In one application (Scintillation Fibers Tracker) we adopted the GBT chipset and in another application (LHCb Vertex Locator) we developed our own Gigabit Wireline Driver with a 5.12 Gbps output bandwidth.

Project's co-ordinator: Aurore SAVOY NAVARRO

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Period covered: from 01/02/2013 to 31/01/2017

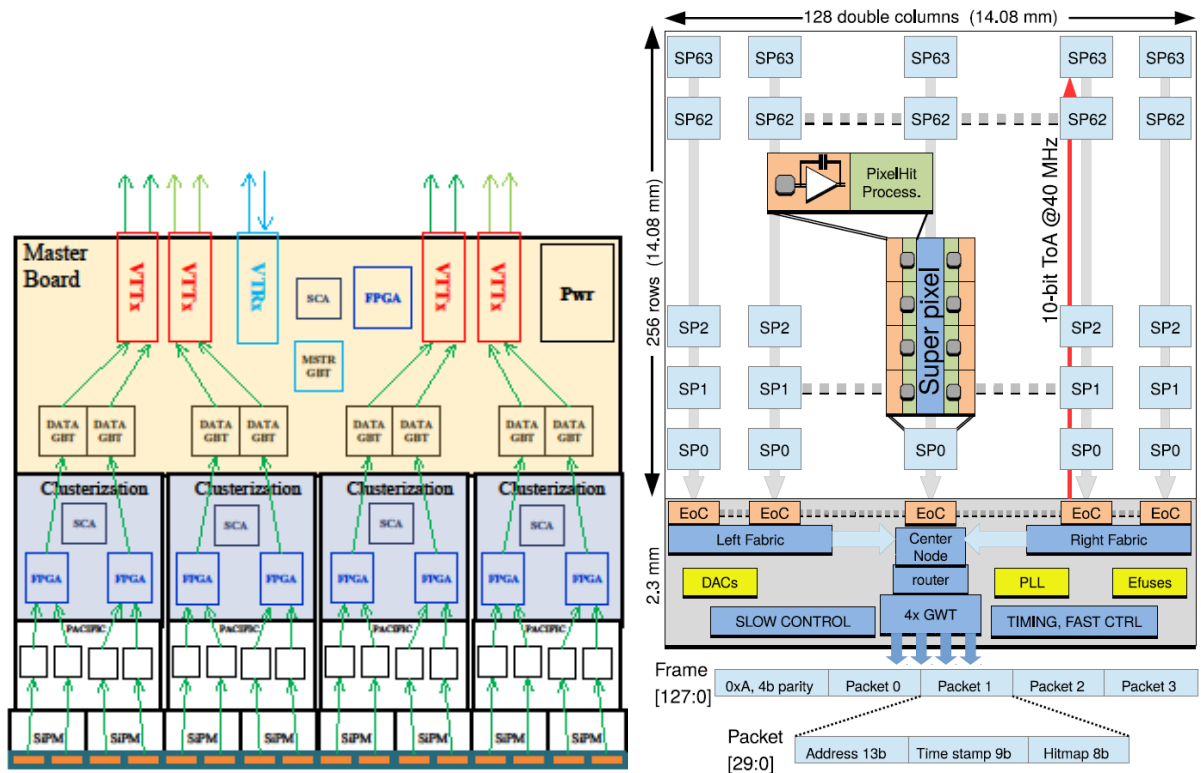
Project website: <http://infieri-network.eu>

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## Talks

- [1] E. Dall' Occo, *Sensor Developments for the LHCb VELO Upgrade, 4th Beam Telescope and Test Beams Workshop*, LAL Orsay, 3-5 February 2016
- [2] E. Dall' Occo, *Progress Report on Pixel Detector for LHCb VELO Upgrade, 7th INFIERI Workshop, Lisbon*, 14 April 2016
- [3] E. Dall' Occo, *Pixel Detector for LHCb VELO Upgrade, 8th INFIERI Workshop, FNAL*, 17-21 October 2016
- [4] E. Dall' Occo, *Sensor Characterization for the LHCb VELO Upgrade, NNV Annual Meeting, Lunteren*, 4 November 2016
- [5] E. Dall' Occo, *LHCb VELO Upgrade: Testbeam Results, Nikhef Jamboree, Groningen*, 13 December 2016
- [6] E. Dall' Occo, *Update on Timepix3 Telescope and Grazing Angles Results, 5th Beam Telescope and Test Beams Workshop, Barcelona*, 24-27 January 2017

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### Poster Presentations

- [1] E. Dall' Occo, *Edge Studies on sensors for the LHCb VELO Upgrade*, 3rd International School on Intelligent Signal Processing for Frontier Research & Industry, 14-25 September 2015, Hamburg, Germany (poster)
- [2] E. Dall' Occo, *Edge Studies on sensors for the LHCb VELO Upgrade*, First Barcelona Techno Week (Course on Semiconductor Detectors), 11-15 July 2016, Barcelona, Spain
- [3] E. Dall' Occo, *Edge Studies on sensors for the LHCb VELO Upgrade*, 8th INFIERI Workshop, FNAL, 17-21 October 2016

### Publications:

- [1] T. Kirn, "SciFi – A large scintillating fibre tracker for LHCb", NIMA 845, 581-485 (2017).
- [2] P. Moreira et al., "The GBT SerDes ASIC prototype", 2010 JINST 5 C11022.
- [3] W. Vink, "LHCb Scintillating Fiber detector Front end electronics Design & Test", <https://cds.cern.ch/record/2198699>
- [4] S. Naik, "On-detector Electronics for the LHCb VELO Upgrade", Journal of Instrumentation, Vol. 12, February 2017.
- [5] V. Gromov et al., "Development of a low power 5.12 Gbps data serializer and wireline transmitter circuit for the VeloPix chip", 2015 JINST 10 C01054.
- [6] T. Poikela et al., "The VeloPix ASIC", 2017 JINST 12 C01070.

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