AIDA innova

Advancement and Innovation for Detectors at Accelerators

WP13 - Blue Sky project: Wireless Data Transfer for High-Energy Physics Applications

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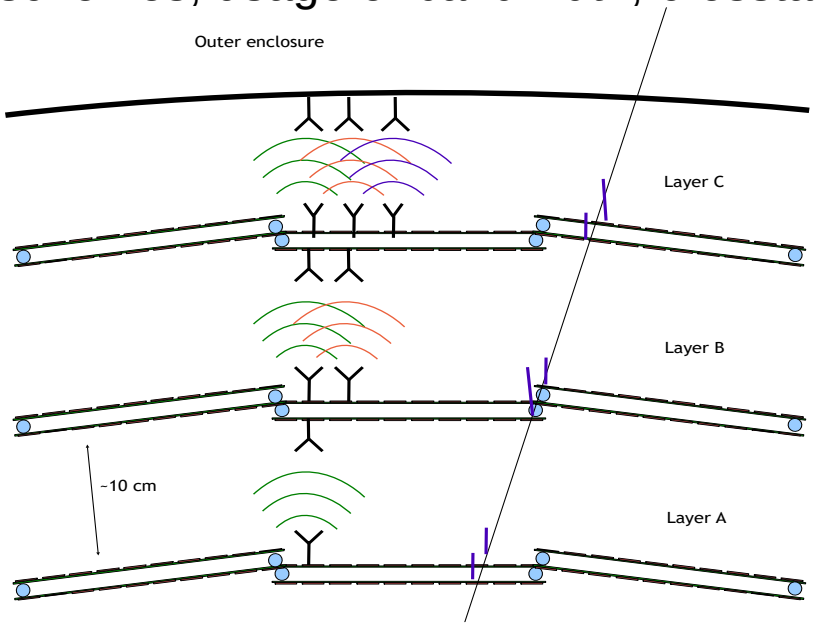
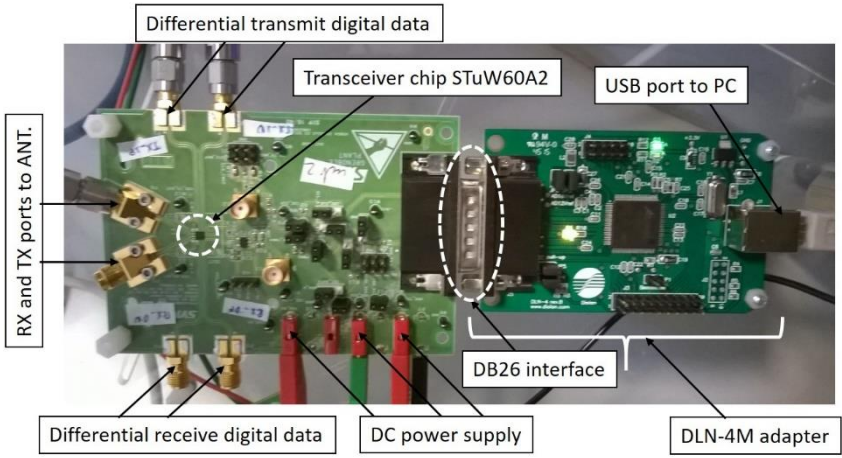
Blues Sky project: Wireless Data Transfer for High-Energy Physics Applications

- Study of components and antennas integration
- Full link demonstrator(s) from 1 tile to 2 and 3 tiles – several mock-ups to be tested
- Use and integrate commercially available components
- Study the performance of the system (data rate, bit error rate, modulation schemes, usage of bandwidth, crosstalk in repeater, etc.)





Debit 1 Gbps per layer and is cumulative, thus it will be reaching 3 Gbps at the outer enclosure.

Courtesy of CEA-Letti and STMicroelectronics

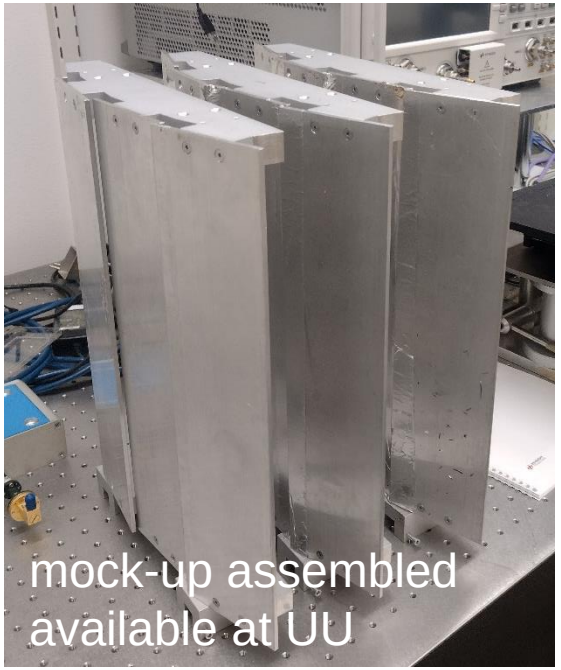
Deliverables

Deliverable 1: First mock-up assembled and tested during the first year, including study of antenna technologies allowing a seamless integration in such a harsh environment (strong irradiation and magnetic fields); specification of the antennas.

Deliverable 2: Second mock-up assembled and tested during the two next years. Three or four layers of silicon detector with their readout, equipped with low power consumption transceiver and antennas.

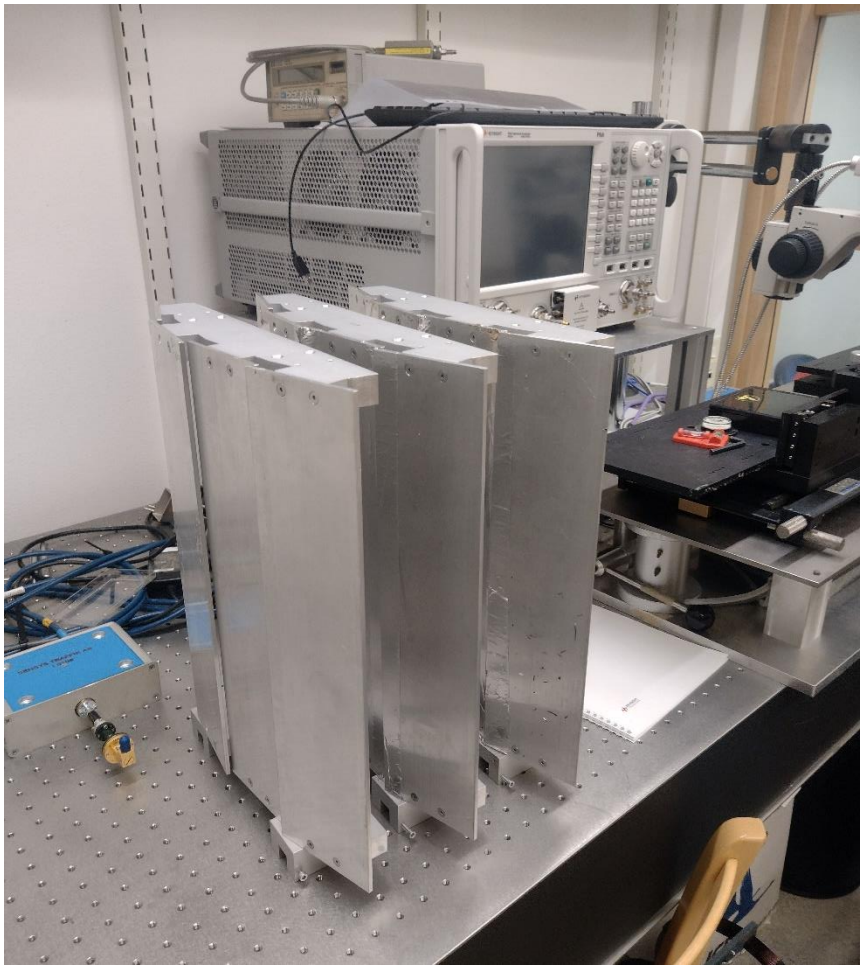
Deliverable 3: Published study of performance in HEP environment and access to technology for new user communities. Make packages available with user support.

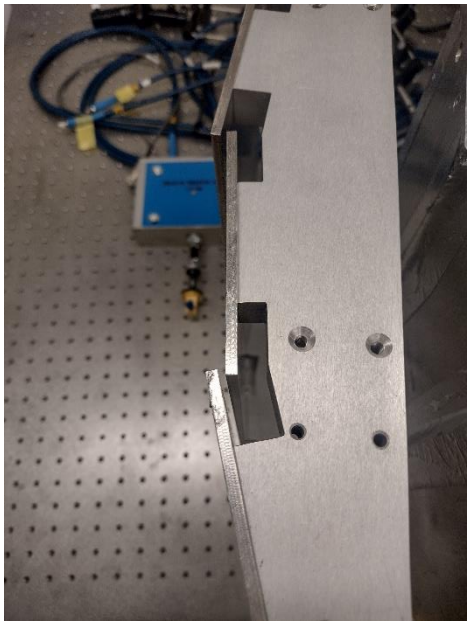
Deliverable 4: (in option depending on the time left) Study of the cumulative noise in multi-hop data transmission and jitter, development of wireless communications strategies for managing crosstalk


mock-up assembled available at UU


EPS SK202
available 10 TX/RX at UU

Demo set-up in place

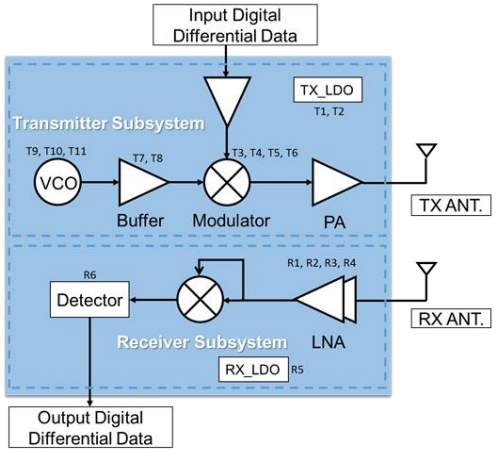


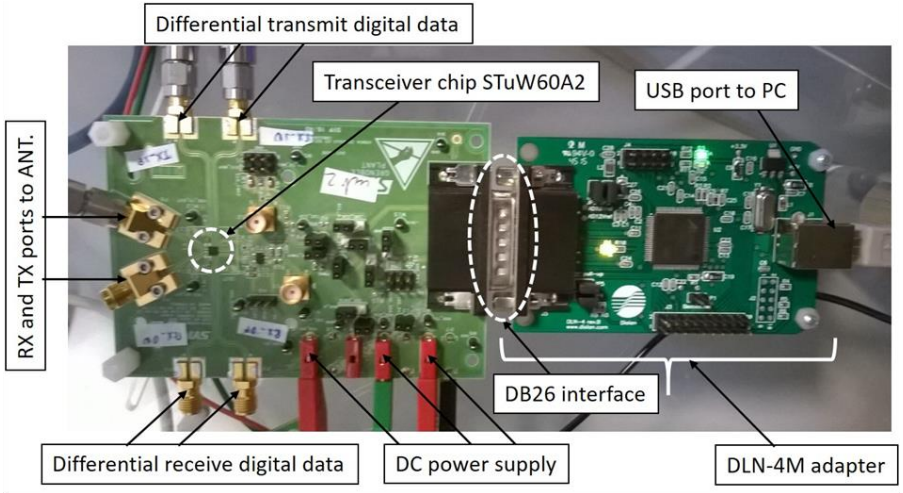


D1 and D2
Enables access to technology for new user communities – D3

D1 - 1 GB/s demo

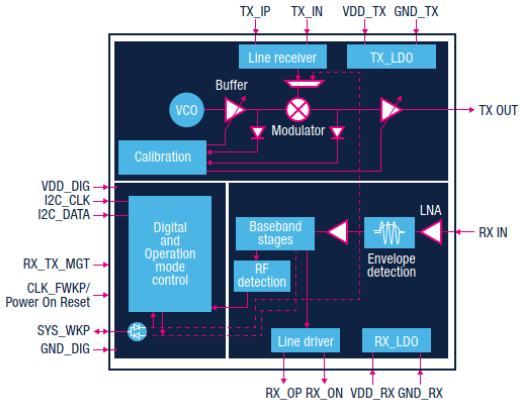
EPS SK202
available 10 TX/RX



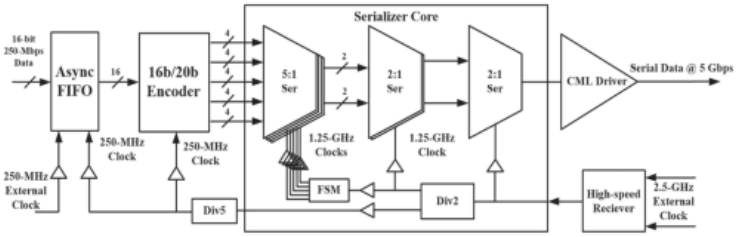


Courtesy of
CEA-Letti and
STMicroelectronics

D2 - 2 and 3 GB/s demo

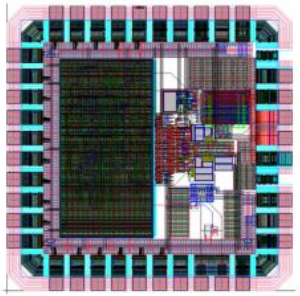


60 GHz contactless connectivity
- -40, +105° C
- BGA 2.2 x 2.2 mm²
- 44 mW Tx, 27 mW Rx

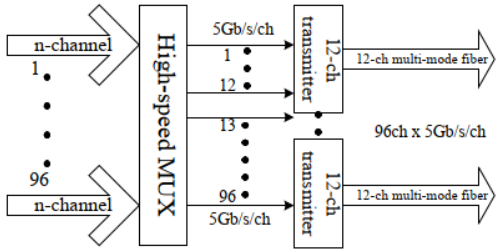


Development of a serial link transmitter for monolithic active pixel sensors

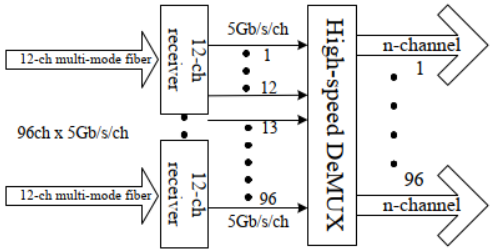
W. Zhou,[a] X. Niu,[a,*] W. Han,[b] X. Li,[a,c] Q. Wang[c] and C. Zhao[a,c]

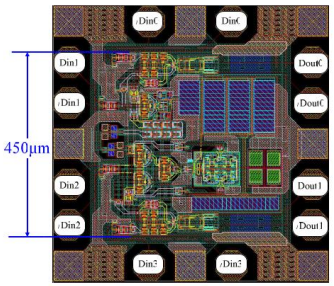


Transmitter Array



Receiver Array





Multi-channel 5Gb/s/ch SERDES with Emphasis on Integrated Novel Clocking Strategies

Changchun Zhang[*,**,***], Ming Li[*], Zhigong Wang[**], Kuiying Yin[*], Qing Deng[*], Yufeng Guo[***], Zhengjun Cao[*], and Leilei Liu[*,****]