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The RD53 programme and the CHIPIX65 / INFN project for the development of pixel readout chip for extreme rate and radiation

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The scope of RD53 is the development of pixel readout Integrated Circuits (IC) for the next generation of pixel readout chips to be used for the ATLAS and CMS Phase 2 pixel detector upgrades and future CLIC pixel detectors.
This does not imply that ATLAS and CMS must use the same exact pixel readout chip, as most of the development, test and qualification effort needed is independent of the specific implementation of the final chips. Multiple implementations are possible using the same technology foundation. In order to be effective, this collaboration is specifically focused on the design of pixel readout chips, and not on more general chip design or on other aspects of pixel technology.
The IC challenges include: smaller pixels to resolve tracks in boosted jets, very high hit rates, unprecedented particle fluence, much higher output bandwidth, and large IC format with low power consumption in order to instrument large areas while keeping the material budget low

Seven INFN units are participating to RD-53 and have formed the CHIPIX65 / INFN project, with 35 members experts on the field, of which 20 are actual VLSI designers, constituting a substantial fraction of INFN expertise on microelectronics. This makes
CHIPIX65 a unique opportunity for an efficient propagation across INFN of CMOS 65nm technology and constitutes the greatest collaboration on a microelectronics project ever made across INFN

The talk will report on recent progress of RD53 and in particular on the contributions from the CHIPIX65 / INFN project.

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