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ASICs and Front-end electronics development at USP

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In the past years a collaboration has been set between our group (HEPIC@IFUSP) of the USP Physics Institute and the Sistemas Eletrônicos Integrados group of the USP Polytechnic School (EPUSP), making possible the development of a front-end ASIC, named SAMPa, for the readout of gaseous detectors. The ASIC was originally developed to instrument the new Gas Electron Multiplier (GEM) readout plane of the ALICE Time Projection Chamber, as well as to upgrade the front-end of the Multi Wire Proportional Chamber of the ALICE Muon Tracker, but it soon became the choice for the electronics of other high energy and nuclear physics experiments.

An ASIC represents only a component of a readout system, and big experiments usually embed it into custom Front-End boards, including interfaces to be integrated in their own DAQ system, preventing reuse outside their specific environment. To fulfil an internal demand for gaseous detector readout, and to allow the use of SAMPa by a wider community, the collaboration with the Engineering School continued with a project for the integration of SAMPa into the Scalable Readout System (SRS), a electronic framework developed by the RD51 network, which unites the community working on MicroPattern Gaseous Detector.

We will present the results so far of this project, which has already produced a fully functional and near-final front-end.

On the other hand, microelectronics technology is subject to obsolescence, so we will report on a joint effort with a French group aimed at designing a next generation, finer technology, improved performance and versatile ASIC for the readout of gaseous detector.

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