



# Sample Project: ASIC design and qualification for radiation hard depleted monolithic active pixel sensors for the ATLAS Tracker upgrade RD

Code	<del>PH1102</del>
Programme	FCT
Department	PH
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<b>Title</b>
ASIC design and qualification for radiation hard depleted monolithic active pixel sensors for the ATLAS Tracker upgrade RD programme

<b>Description</b>
<p>The ATLAS collaboration is currently developing new silicon sensors to cope with the requirements of a tracker upgrade for HL-LH Phase II operation. The ATLAS ITK tracker will need to cope with up to ten-fold increase in radiation damage, hit occupancy and data rates which will require new or improved sensor technologies. Furthermore dedicated timing detectors can help to reconstruct superimposed collisions ("pileup" of up to 200 collisions in a single beam crossing)</p> <p>Depleted radiation hard CMOS sensors are promising new candidates: they allow to improve performance and functionality, as active electronics can be included directly in the sensor, which e.g. allows to increase the spatial resolution through sub-pixel address encoding. Furthermore it uses established industrial CMOS production processes providing a significant cost advantage over traditional specialty processes used for planar silicon sensors.</p> <p>Our group strongly pursues the development of depleted CMOS sensors, in particular the development and qualification of radiation hard monolithic active pixel sensors (DMAPS).</p> <p>The candidate will work in a team of engineers and physicists to design DMAPS CMOS sensors with a focus on radiation hard, low power ASIC design in selected different imaging sensor processes. The project will include the design of dedicated prototype structures and to contribute to larger chip designs. Radiation tests and qualification of existing structures will complement the training on ASIC design and associated radiation qualifications in irradiation campaigns, lab measurements and testbeams.</p>

<b>Skills</b>
Education in electronics engineering or applied physics, experience in or keen interest to acquire knowledge in design and system integration of VLSI electronics.

## Disciplines

Applied Physics, Electronic Engineering

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