



Project Title:	<i>Design of A/D converter for a CMOS-based Magnetic Imaging Sensor</i>
Project Short description	<p>The project consists on the design of a full CMOS A/D converter to be integrated in CMOS-based Magnetic Imaging Sensor (MIS). The MIS currently under development uses magnetic tunnel junction (MTJ) devices integrated in a CMOS wafer. The reading of each magnetic pixel requires a signal conditioning and A/D conversion channel to generate digital information of magnetic sensor. Data is to be transferred from the CMOS MIS to host for further image processing. The student will evaluate/simulate ADC architectures, its resolution and sampling rate according to system specifications. Upon selecting the ADC, he will design it at transistor level targeting a standard CMOS process (AMS 0.35um). The design of such block will follow Cadence design flow (Schematic and Layout editing as well as simulation tools). The block will be integrated in the full CMOS MIS for fabrication. Student will also be required to perform Test and Characterization of such ADC.</p>
Expected Start/end date	Sep 1 st , 2014 – July 30 th 2015
Required degree and Background knowledge of students, minimum gradepoint average, etc...	<p>Students applying to this project should preferably have a background on Electrical/Electronics Engineering and be knowledgeable in:</p> <ul style="list-style-type: none"> - Analog design (Opamp architectures and basic blocks like current mirrors and voltage references) - Noise analysis and modelling - Mixed-mode and Spice simulation (HSpice, Spectre or other Spice simulation) - Cadence design tools - Matlab <p>Nice to have skills</p> <ul style="list-style-type: none"> - Some knowledge in ADC architectures (any of SAR, Pipeline and Sigma-Delta)

Supervisor at INL

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