



In Grenoble, at the heart of the French Alps, Leti is a research institute specialized in micro- and nano-technologies. At the interface between academia and industry, Leti develops and transfers innovative technologies via a large number of research programs.

Keywords: modeling, semiconductor physics

Master thesis (6-month internship): Compact modeling of PDSOI transistors

Context: The Partially Depleted Silicon-on-Insulator (PDSOI) technology has been widely deployed and is already used in numerous applications. Yet, there is still no satisfactory compact model dedicated to this technology. A compact model is based on the analytical equations of device physics. Unlike a numerical solver, the analytical compact model can be implemented in a very robust and fast code that meets industry's requirements.

The Simulation and Modeling team at Leti is expert in the development of compact models. It recently started the modeling of PDSOI transistors in partnership with semiconductor companies.

Objective: The goal of the master thesis is to contribute to the modeling work initiated by our research team. To describe accurately the behavior of a PDSOI MOSFET, the student will seek an explicit solution based on the equations of semiconductor physics. This analytical solution will be compared to numerical simulations (TCAD). The model will include short and narrow channel effects. It will also describe accurately the transitions between the different operating regimes.

Required profile: Master's student with a strong background in semiconductor physics and a good understanding of basic devices such as diode and transistor.

Start date: The master thesis will start around February 2022, depending on student's availability. At the end of the internship, the student will have the opportunity to apply for a PhD on the same topic.

Research team: LETI/DCOS/SCCS/LSM

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