Title of tutorial: Analog integrated circuit design using opensource software tools and PDKs

Abstract (300 words maximum for inclusion in registration materials)
→ Analog integrated circuit design has traditionally posed high entry barriers for professionals and researchers, particularly in low-income countries. In today's landscape, opensource computer-aided-design (CAD) tools and freely available process design kits (PDKs) have democratized access to design capabilities, enabling diverse stakeholders, including students, "makers", professionals and researchers, to experience design in the context of manufacturable silicon technologies. This tutorial focuses on the design of analog integrated circuits utilizing opensource software and open industrial data, facilitating the process from conceptualization to foundry-ready physical implementations. In the first part, we offer a comprehensive introduction to the fundamental concepts and tools essential for constructing analog circuit simulation testbenches. Through a hands-on approach, participants gain proficiency in using opensource software for accurate and efficient simulation. The second part of the tutorial focuses on the physical implementation aspect, shedding light on future prospects in automated layout generation. Furthermore, attendees will benefit from a myriad of recent examples showcasing actual opensource chip designs, thereby illustrating the real-world applicability of these tools.

Duration of tutorial (1.5 or 3 hours tutorials): 3 hours

Instructors: Jorge Marin and Juan Sebastian Moya (see CVs attached)

Expected impact: This tutorial aims to equip engineers, students, and researchers alike with the tools and knowledge to embark on their analog IC design journey, fostering innovation, and expanding the frontiers of analog integrated electronics in a collaborative manner. The hands-on approach will enable participants to progress from basic simulations up to more complex design explorations. This guided session serves as a catalyst for analog design enthusiasts to join the dynamic open-source ecosystem dedicated to advancing the field of analog integrated circuit design.

Required Materials: The tutorial will be strongly based on simulation examples and oral presentations with support slides. On a first scenario, participants can download a repository and connect to an available server (to be set up with the analog opensource docker available from JKU https://github.com/iic-jku/iic-osic-tools) from their laptops, so they can follow the practical sessions in real time. In a second scenario, the examples will be explained in detail during the tutorial, and participants can download the needed files and set up the docker later on to follow the provided examples offline.