Master thesis

» Design and Analysis of a Polarization Splitter for C-Band in 45-nm SPCLO GlobalFoundries Technology «

The Circuit and System Technology research group offers a Master's thesis.

Task Description:

- This thesis focuses on the design, analysis, and simulation of polarization splitters in 45-nm SPCLO GlobalFoundries technology, starting with a literature study to understand the principles and applications of polarization splitters in integrated photonics.
- Building on this foundation, the student will analyze an existing O-Band polarization splitter from GlobalFoundries by:
    - Reconstructing the device in Ansys Lumerical.
    - Performing detailed simulations to compare results with the reference design.
    - Implementing the component in Python.
- In the next phase, the student will develop a polarization splitter optimized for C-Band operation.
- Transfer the geometry to Cadence Virtuoso.
- Perform design-rule checks in Cadence Virtuoso.
- Create a Verilog-A model to translate EM simulation results into a Virtuoso-compatible behavioral model.
- Finally, evaluate the results and provide an outlook on potential improvements.

Requirements:

- CV and grade sheet.
- Lectures: Circuit & System Design plus and Field and Waves
- Projet Silicon Photonics or at least one project in our department is recommended
- Experience in 3D Solvers (Lumerical, CST, ADS Keysisght EM solvers) is advantageous. Experience in CADENCE Virtuoso or ADS is recomended. Some programming knowledge Python/Verilog-A are advantageous.

In case of interest, please send an e-mail containing your latest transcript of records to Martin Mihaylov (martinmi@hni.upb.de)

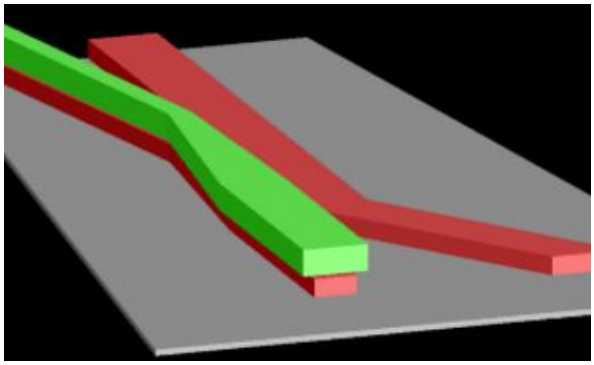

Figure 1: Polarization Splitter from GlobalFoundries 45-nm SPCLO (https://gf.com/de/blog/silicon-photonics-marriage-optical-and-digital-gfs-rf-process/)

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