Master thesis

» Design, Simulation and Optimization of photonic components for C-band operation in 45nm CMOS SPCLO EPIC Technology «

The research group
Circuit and System Technology
offers a
Master thesis

Task Description:

- Literature research focusing on EM-simulation techniques, operation and geometries of standard photonic components (waveguides, couplers, photodetectors)
- EM simulations performed with Ansys Lumerical
- Adaption of given Lumerical scripts towards:
  a) Re-simulation of given geometries for O-band operation (validation of the scripts)
  b) Simulation of C-band components (waveguides, coupler)
  c) Parameter optimization
- Writing of own Lumerical scripts for photodiode design
- Geometry transfer to Cadence Virtuoso
- Design Rule check in Cadence Virtuoso
- Optional: VerilogA modelling (Transfer of EM-simulation results to Cadence Virtuoso compatible models)
- Finally, an evaluation of the work as well as an outlook should be given.

Requirements:

- CV & grade sheet
- Lectures:
  Circuit & System Design
  (DE: Schaltungstechnik)
  and Fields & Waves
  (DE: Theoretische Elektrotechnik)
- Project Silicon Photonics
- Experience in Ansys Lumerical is advantageous
- Further courses from Theoretical Electrical Engineering (Prof. Förstner) are advantageous

In case of interest, please send an e-mail containing your latest transcript of records to Tobias Schwabe (schwabet@hni.uni-paderborn.de, room F0.411)

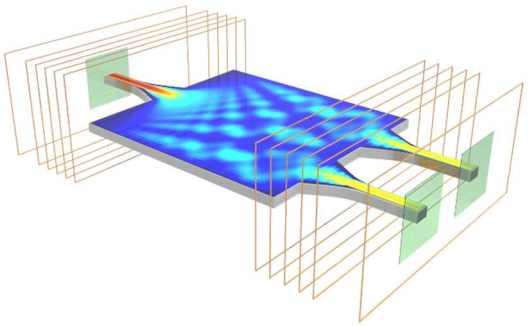

Figure 1 Simulated electrical fields in a multimode interferometer (https://optics.ansys.com/hc/en-us/articles/360042305194-Multi-Mode-Interference-MMI-Coupler)

Circuit and System Technology
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