University of Stuttgart
Institute of Electrical and Optical Communications

MA

Active Single Trench TE/TM Mode Converters for Photonic Integrated Circuits

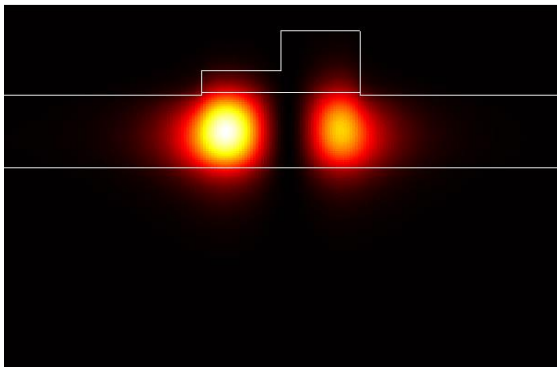
Objective:
- Simulation
- Optimization

Your profile:
- Experience in working with Python
- Knowledge in integrated photonics
- You have the ability to work independently and solve problems on your own
- Previous knowledge in electromagnetic simulation is beneficial

We offer:
- Individual supervision and support
- Freedom to contribute and implement your own ideas
- Access to state-of-the-art facilities and advanced simulation tools

Background:
Photonic Integrated Circuits (PICs) have become a key component of modern communication technologies in recent years. They are used in a variety of commercial products where they enable complex optical functions such as pre-filtering and multiplexing. These PICs are typically fabricated on silicon platforms, similar to electronic circuits. To further increase the versatility of these devices, the integration of specialized components such as polarization converters is essential. An integrated polarization converter allows the manipulation of the polarization states of light, which is critical for enhancing the functionality and efficiency of photonic systems, particularly in applications like optical signal processing and on-chip communication.

Your task:
The project will focus on comparing and optimizing single trench TE/TM mode converters through simulations that analyze their passive characteristics. Additionally, the active behavior of these devices will be explored when integrated with a thermo-optical phase shifter for dynamic control. This will involve the development of a mode-selective metamaterial-based thermo-optical phase shifter.



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