

Assembly of an experimental system for light coupling on photonic chips

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Abstract

The project aimed the theoretical and experimental study of the propagation of light on photonic micro-structures applied to optical communication. It was set up on the workbench an experimental system so the coupling of an optical fiber's light on a photonic chip could be done, and it made possible to characterize the silicon waveguide transmission properties.

Key words: Photonics, Waveguides, Optical Communications.

Introduction

Micro-structured photonic material offers the potential for the propagation of light control and its interaction with matter. Understanding the origin and characteristics of the scattering processes in photonic guides is very important, both on linear and nonlinear regimes. However, to study these processes we need to insert and collect light from the photonic waveguide, making necessary an appropriate system set up.

Results and Discussion

Using the Inventor software, we could develop the opto-mechanic and the optical microscope's setup design optimizing the system, reducing the costs and thinking clearly about the system's use practicality.

With the specification of the components and the designs ready, the whole system and the alignment of a fiber with the chip for its characterization were set up on the workbench (Image 1).

However, the chips coming from manufacturing are not ready to be tested, so it is necessary to prepare them.

For sampling preparation purposes, an improved polishing process was developed in the laboratory especially for these chip models, making them ready for testing.

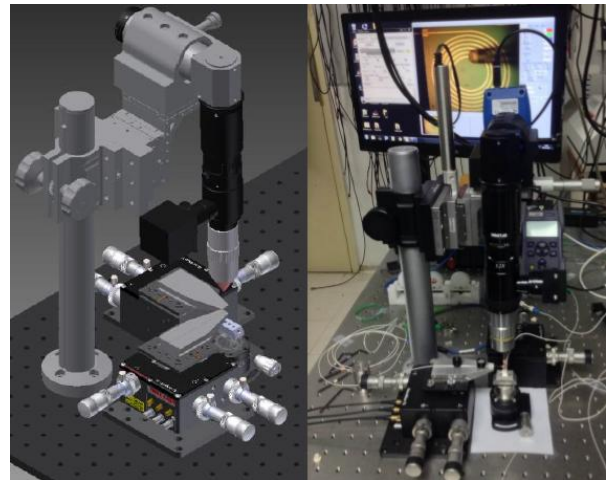


Image 1 Scheme of the experimental setup: (Left) using Inventor software; (Right) photo taken from the real system.

Conclusions

The experimental set up can be developed, as proposed. Currently, the system is operating in the Optical Communications Laboratory of Unicamp and it is used both by researchers and students.

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