

Master 2 "Systèmes Complexes, Optique, Lasers (SCOL)": Research Training 2022-2023
Master 2 "Matter Molecules and their Environment(MME)": Research Training 2022-2023

Appel à sujet de stage recherche / Call for research training subject

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Topic: Optical fibers and amplifiers

Master 2: select the master and the most appropriate option

<input checked="" type="checkbox"/> Master 2 SCOL	<input type="checkbox"/> Master 2 MME (GP-SCP)
<input type="checkbox"/> Option Complex Systems (GP-IKS)	<input type="checkbox"/> Option Condensed Matter
	<input type="checkbox"/> Option Condensed Matter/Pharma
	<input type="checkbox"/> Option Dilute Matter and Spectroscopy
	<input type="checkbox"/> Option Atmospheric Sciences
	<input type="checkbox"/> Option Modeling at the molecular & atomic scales

Performances in Amplification regime of Bismuth doped fibers

Maximum data capacity of single mode optical fiber is estimated to roughly 100 Tbits/s due to the Shannon limit and non-linear effects that can be observed above a power threshold depending on the core radius value. To go beyond this value, several routes can be chosen. For instance, without modifying the existing networks that are using single-mode fibers, it is possible to extend the classical optical bandwidth used to transmit data (C band 1530 nm - 1565 nm). To this end, one has to develop efficient amplifiers based on doped optical fibers for other transmission band like the O-band (1260 nm - 1360 nm), E-band (1360 nm- 1460 nm), and S-band (1460 nm - 1530 nm). Among all possible dopant that can be incorporated in the fiber core, Bi-doped fibers prove to be good candidates to reach the level of amplification needed, if the fiber composition and the pumping scheme is suited.

The Photonic Team is implied since many years in the design, realization and assessment of such new specialty optical fibers. Main objectives of the internship concern the optical characterization of new Bi-doped fibers and their tests in amplification regime. New characterization techniques such as Spectrally and Spatially resolved method could be used to determine the modal content of the fiber.

Key words: Optical fibers , amplifiers, telecom, guided modes, amplification