Photonic Circuits Diagnosis

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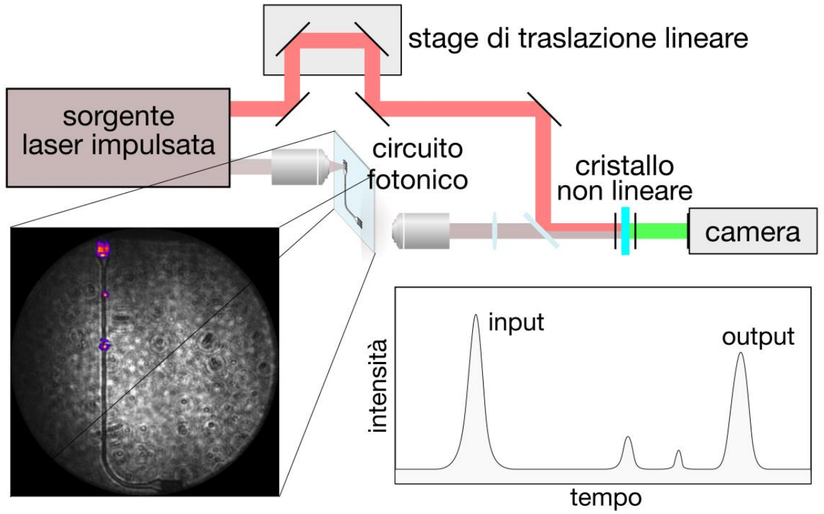
Invention

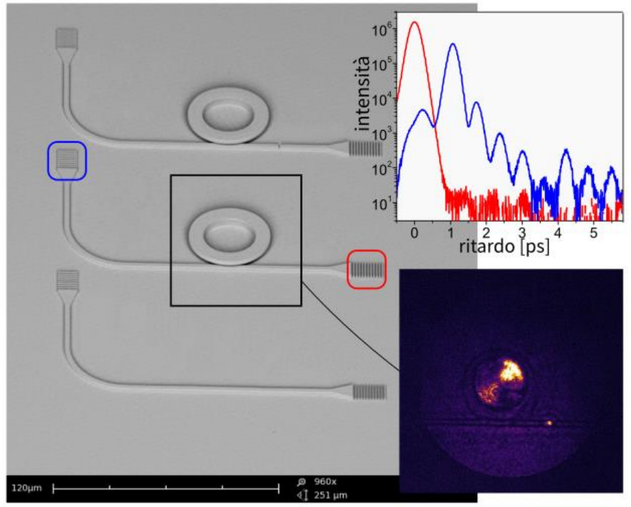
The invention is part of the technical sector of optical equipment for the characterization and diagnostics of integrated photonic circuits, that is, all those circuits capable of producing, propagating and manipulating optical signals that can be used for multiple applications, from sensors to telecommunications.

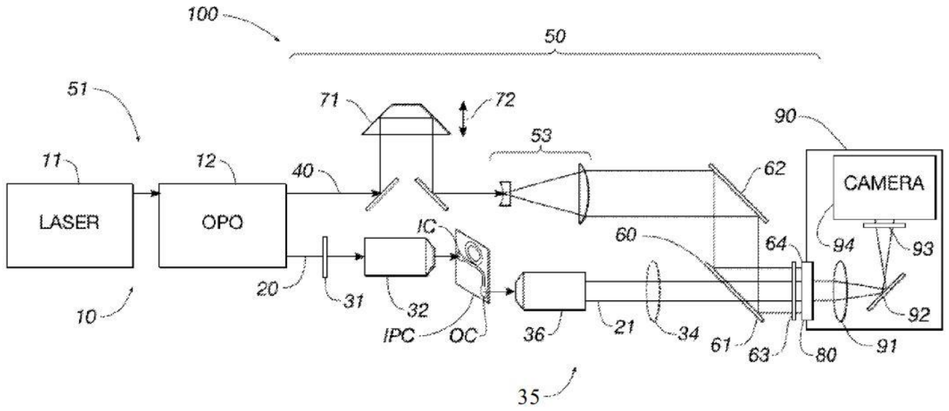
Integrated photonic circuits have numerous advantages over current electronic circuits in terms of processing efficiency and speed. However, it is necessary to develop new investigation techniques to verify their correct functioning and to perform diagnostic procedures aimed at verifying the integrity and accuracy of the manufacturing processes. The known techniques of characterization and diagnosis present to date various limitations, being invasive or in any case perturbative of the circuit to be examined, or specific with respect to certain materials, or characterized by long sequential scanning times of the circuits or by insufficient spatial or temporal resolution, and therefore incompatible with on-chip integrated circuit diagnostics. The present invention overcomes these limitations by introducing a method and a non-perturbative characterization apparatus with a wide field of view and high temporal resolution, suitable for integrated photonic circuits regardless of their size and manufacturing material.

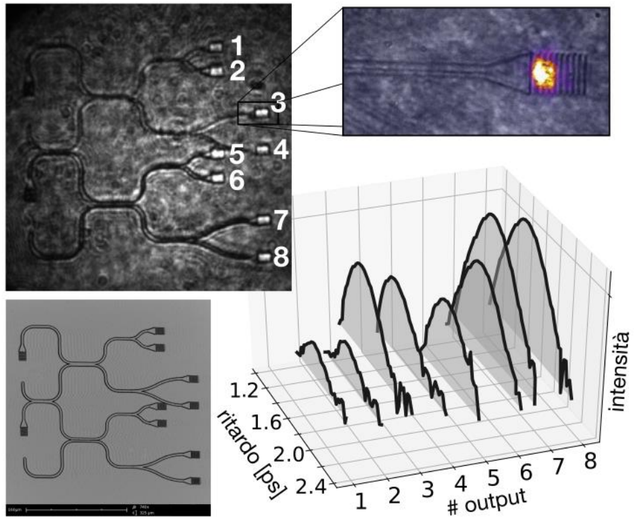
The patent is in joint ownership with LENS - European Non-Linear Spectroscopy Laboratory

Drawings & pictures









Industrial applications

The invention finds application in industry that requires high spatial and temporal resolution analysis of photonic circuits, to carry out non-perturbative diagnostics of integrated photonic circuits in situ and to measure the local propagation speed of optical signals in integrated photonic circuits.

The main advantages of the invention consist in the compatibility with different materials and substrates used for the fabrication of photonic circuits, in the high spatial and temporal resolution for the detection of optical signals, in the compatibility with integrated circuits and in the wide field of view for the analysis of large regions, resulting in reduced analysis times.

Possible developments

The patent is available for exclusive and non-exclusive assignment or license. The licenses are available for the entire remaining term of the patent titles.

The research group is available for new research activities in collaboration and on behalf of third parties, technical insights, scientific advice, also aimed at raising the TRL of technology.

The TRL of the invention is 4.

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