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Ion beams for integrated photonics

Ion beam technologies have been developed in the past century to ultimate perfection and are today standardized techniques for the realization of integrated electronic circuits. Actually, the production of a modern processor needs about 20-30 ion implantation steps for selective area doping. On the other hand, the 21st century is considered by many to be the century of light, following a century of grandiose developments in electronics. Today, one should especially highlight in this respect the achievements in telecommunication allowing us individual video live streaming around the world with no time delay. The next upcoming revolution will be here the miniaturization of optical components and the commercialization of photonic integrated circuits (PIC) for various applications, which also includes quantum devices. The beauty and prospect in this upcoming process is the possibility of merging PICs with electronic circuits, but also taking advantage of the already well-developed and established manufacturing techniques. This will also include ion beam techniques for side selective optical doping as well as the realization of defect centers for quantum applications. I will present several experiments for the manipulation of the optical properties of (nano)materials using ion beams, as well as corresponding strategies for the realization of integrated photonic and quantum devices [1-4].

References

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