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Nota di contenuto	Preface -- Acknowledgement -- Contents -- List of Figures -- List of Tables -- Abbreviations -- Chapter 1: Introduction to Quantum Dots -- Chapter 2: Low energy ion implantation over single layer InAs/GaAs quantum dots -- Chapter 3: Optimizations for quaternary alloy (InAlGaAs) capped InAs/GaAs multilayer quantum dots -- Chapter 4: Effects of low energy light ion (H) implantations on quaternary-alloy-capped InAs/GaAs quantum dot infrared photodetectors -- Chapter 5: Effects of low energy light ion (H) implantation on quaternary-alloy-capped InGaAs/GaAs quantum dot infrared photodetectors.

Sommario/riassunto

This book looks at the effects of ion implantation as an effective post-growth technique to improve the material properties, and ultimately, the device performance of In(Ga)As/GaAs quantum dot (QD) heterostructures. Over the past two decades, In(Ga)As/GaAs-based QD heterostructures have marked their superiority, particularly for application in lasers and photodetectors. Several in-situ and ex-situ techniques that improve material quality and device performance have already been reported. These techniques are necessary to maintain dot density and dot size uniformity in QD heterostructures and also to improve the material quality of heterostructures by removing defects from the system. While rapid thermal annealing, pulsed laser annealing and the hydrogen passivation technique have been popular as post-growth methods, ion implantation had not been explored largely as a post-growth method for improving the material properties of In(Ga) As/GaAs QD heterostructures. This work attempts to remedy this gap in the literature. The work also looks at introduction of a capping layer of quaternary alloy InAlGaAs over these In(Ga)As/GaAs QDs to achieve better QD characteristics. The contents of this volume will prove useful to researchers and professionals involved in the study of QDs and QD-based devices.