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Comparison study of the charge density distribution induced by heavy ions and pulsed lasers in silicon

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摘要

Heavy ions and pulsed lasers are important means to simulate the ionization damage effects on semiconductor materials. The analytic solution of high-energy heavy ion energy loss in silicon has been obtained using the Bethe-Bloch formula and the Kobetich-Katz theory, and some ionization damage parameters of Fe ions in silicon, such as the track structure and ionized charge density distribution, have been calculated and analyzed according to the theoretical calculation results. Using the Gaussian function and Beer's law, the parameters of the track structure and charge density distribution induced by a pulsed laser in silicon have also been calculated and compared with those of Fe ions in silicon, which provides a theoretical basis for ionization damage effect modeling.

关键词 [heavy ion, pulsed laser, charge density distribution](#)

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