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Title:InAs/InP/InSb Nanowires as Low Capacitance n-n Heterojunction Diodes
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Abstract:Nanowire diodes have been realized by employing an axial heterojunction between InAs and InSb semiconductor materials. The broken-gap band alignment (type III) leads to a strong rectification effect when the current-voltage (I-V) characteristic is inspected at room temperature. The additional insertion of a narrow InP barrier reduces the thermionic contribution, which results in a net decrease of leakage current in the reverse bias with a corresponding enhanced rectification in terms of asymmetry in the I-V characteristics. The investigated diodes compare favorably with the ones realized with p-n heterostructured nanowires, making InAs/InP/InSb devices appealing candidates to be used as building blocks for nanowire-based ultrafast electronics and for the realization of photodetectors in the THz spectral range.
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