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Title:Subterahertz Acoustical Pumping of Electronic Charge in a Resonant Tunneling Device

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Abstract:We demonstrate that controlled subnanosecond bursts of electronic charge can be transferred through a resonant tunneling diode by successive picosecond acoustic pulses. The effect exploits the nonlinear current-voltage characteristics of the device and its asymmetric response to the compressive and tensile components of the strain pulse. This acoustoelectronic pump opens new possibilities for the control of quantum phenomena in nanostructures.

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Inspec controlled terms:acoustic pulses - acoustoelectric devices - compressive strength - nanoelectronics - resonant tunnelling diodes - tensile strength - terahertz wave devices

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Inspec classification codes:B2560H Junction and barrier diodes - B2860C Acoustic wave devices

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