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Title:Terahertz generation using a resonant-tunneling-like configuration in graphene

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Abstract: The manuscript presents a simple graphene-based device able to generate at room temperature ultrashort pulses in the sub-picosecond range and thus able to generate signals up to 3–4 THz and beyond. The electrons produced by a short laser pulse incident on a graphene monolayer excite two oblique gates polarized with different dc voltages. The two gates are biased such that the quantum transmission has an isolated sharp peak in a narrow energy bandwidth. Such a transmission mimics the main property of a resonant tunneling structure, usually consisting of a semiconductor heterostructure, and generates an electric pulse with sub-picosecond duration and a spectrum with a cutoff frequency that can exceed 3 THz .

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