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【153】 Novel quantum cascade detectors (QCD) for telecommunication applications between 9 – 10 μm wavelength

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As wireless near-IR telecommunications through air and space are reaching their performance-limitations in terms of bandwidth and transmission under turbulent conditions, solutions for low-atmospheric attenuation data transmission are sought. Quantum-cascade-based systems offer such capabilities, i.e. intrinsically high GHz-modulation properties and robust free-space transmission by addressing the long-wavelength infrared region of 8-12 μm .

A novel InGaAs/InAlAs/InP QCD for the 9-10 μm range as crucial building-block of a monolithic-integrated heterodyne detection system is presented. We show the comparison of differently sized 15-vs-1 period ridge-waveguides and analyze their spectral photocurrent while comparing their performance in terms of sensitivity, spectral responsivity, detector noise etc. The goal is to distinguish the best candidate for a heterodyne sensor.

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