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Title:3.1-THz Heterodyne Receiver Using an NbTiN Hot-Electron Bolometer Mixer and a Quantum Cascade Laser
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Abstract:We have developed the 3.1-THz heterodyne receiver using an NbTiN Hot-Electron Bolometer (HEB) mixer and a THz Quantum Cascade Laser (THz-QCL) as a local oscillator. A quasi optical twin-slot antenna is adopted for the coupling of the RF signal with the mixer. The receiver noise temperature is measured to be 5600 K in DSB. When the optical loss is corrected, it is as low as 2100 K. This result demonstrates that the NbTiN HEB mixer works with the equivalent level of performance at 3.1 THz in comparison with the NbN HEB mixers usually employed in this frequency region.
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Uncontrolled terms:heterodyne receiver - NbTiN hot electron bolometer mixer - quantum cascade laser - HEB mixer - THz-QCL local oscillator - quasioptical twin slot antenna - RF signal-mixer coupling - receiver noise temperature - optical loss - frequency 3.1 THz
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