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Title:Stabilized hot electron bolometer heterodyne receiver at 2.5 THz

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Abstract:We report on a method to stabilize a hot electron bolometer (HEB) mixer at 2.5 THz. The technique utilizes feedback control of the local oscillator (LO) laser power by means of a swing-arm actuator placed in the optical beam path. We demonstrate that this technique yields a factor of 50 improvement in the spectroscopic Allan variance time which is shown to be over 30 s in a 12 MHz noise fluctuation bandwidth. Furthermore, broadband signal direct detection effects may be minimized by this technique. The technique is versatile and can be applied to practically any local oscillator at any frequency.

Number of references:20

Inspec controlled terms:bolometers - fluctuations - hot carriers - receivers

Uncontrolled terms:broadband signal direct detection effects - noise fluctuation bandwidth - Allan variance time - optical beam path - swing-arm actuator - local oscillator laser power - hot electron bolometer mixer - stabilized hot electron bolometer heterodyne receiver - frequency 2.5 THz Inspec classification codes:A0762 Detection of radiation (bolometers, photoelectric cells, i.r. and submillimetre waves detection)

Numerical data indexing: frequency 2.5E+12 Hz

Treatment:Practical (PRA)

Discipline: Physics (A)

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