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(G*) (POS-60) Low Phase Noise Microwave Oscillator Based on Gain Driven Polariton

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High-end microwave systems rely heavily on oscillators with minimal phase noise. The research work introduces a novel method to decrease phase noise by employing a gain-driven polariton platform. Through coherent coupling-induced mode hybridization, frequency distribution around the carrier signal is effectively suppressed.

The approach to achieve minimal phase noise performance will be shown using three prototypes. The first prototype is used to demonstrate the phase noise reduction mechanism (more than 25dB). The second prototype, optimized to operate at a fixed frequency of 3.5GHz, exhibits remarkable phase noise levels of -131 dBc/Hz and -133 dBc/Hz at 10 kHz and 100 kHz offset frequencies, respectively. The third prototype offers a tuning range from 2.1 to 2.7 GHz

The research work merges gain-embedded cavity technology with YIG oscillator technology using cavity magnonics. The integration results in improved spectral purity, leveraging the synergy between the two mature technologies.

Keyword-1

Microwave Frequency Oscillator

Keyword-2

Cavity Magnonics

Keyword-3

Phase Noise

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