TECHNOLOGY LICENCING OPPORTUNITY

Device for Outputting Microwave Signal

Technology Details

University of Manitoba researchers have developed a gain driven polariton platform that represents an innovative on-chip approach with the potential to address phase noise in microwave oscillators. Offering a substantial reduction in phase noise, with heightened spectral purity, and diminished phase instabilities, this technology presents an opportunity to enhance stability, performance, and reliability, while offering a cost-effective solution for a variety of communication, navigation, and measurement systems.

Applications

The technology holds significant promise across various applications and markets. Its integration into on-chip oscillators is crucial for communication, navigation, and measurement systems, presenting an opportunity to enhance stability, performance, and reliability while offering a cost-effective solution. Specifically, in radar systems, the technology's capacity to reduce phase noise and improve spectral purity enhances resolution and detection sensitivity. In communication modules, particularly in densely aggregated subcarrier scenarios, lower phase noise mitigates intercarrier interference, enhancing system performance. The oscillator is well-suited for precision in test and measurement equipment, ensuring accurate and reliable measurements. With a wide tuning bandwidth, it finds applications in advanced microwave frequency uses, crucial in scientific, industrial, and defense-related applications.

Technology Benefits

This innovation excels in improving phase noise performance, offering a substantial reduction in phase noise, heightened spectral purity, and diminished phase instabilities compared to traditional oscillator technologies. The integration of coherent coupling for frequency suppression further distinguishes this technology, effectively mitigating frequency distribution around the carrier and elevating overall oscillator performance.

An additional strength lies in its broadband frequency tunability, exemplified by the third prototype's impressive tuning range from 2.1 to 2.7 GHz while maintaining low phase noise levels. This adaptability positions the technology as versatile, catering to diverse operational needs and surpassing the limitations of fixed-frequency oscillators. The seamless amalgamation of gain-embedded cavity technology and YIG oscillator technology enhances spectral purity and overall performance. Moreover, the prospect of cost-effective on-chip oscillators emerges, as the technology leverages cavity magnonics systems to produce on-chip microwave oscillators with high emission power, low phase noise, and broadband frequency tunability.

Development Stage

Prototypes have been fabricated and characterized in a laboratory setting and are ready for testing/demonstration in an appropriate operational environment.

Patent Status:
PCT Phase (App No. CA2024/051199; filed 12 September 2024).

PRINCIPAL INVENTOR

Dr. Can-Ming Hu
Professor; Department of Physics and Astronomy
University of Manitoba

CONTACT

Dr. Nnanna Ukoji
Technology Transfer Manager
E-mail: Nnanna.ukoji@umanitoba.ca
Phone: (431)-293-0585