



New MIMO Transceiver Cuts Costs, Complexity

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WARF: P150112US01

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a better interference suppression method for high frequency MIMO communication systems.

Overview

In a multiple-input, multiple-output (MIMO) system, multiple antennas are used at both the transmitter and receiver to improve communication performance. MIMO systems are key to high capacity communication at the high frequencies (e.g., millimeter-wave frequencies) being developed for emerging 5G wireless applications.

A limiting factor in MIMO systems is interference between multiple spatial data streams. This requires interference suppression techniques to be used, often involving a device called a phase-coherent local oscillator at the receiver. At high frequencies this adds significant cost and complexity.

The Invention

UW–Madison researchers have designed a MIMO transceiver for improved interference suppression. The new design eliminates the need for a phase-coherent local oscillator.

More specifically, the new architecture – called differential MIMO or D-MIMO – enables linear interference suppression between multiple spatially multiplexed and differentially encoded data streams. In particular, it is based on a novel approach to quasi-coherent channel measurement from differential measurements that do not require phase coherence between transmitter and receiver. A number of system architectures – with different tradeoffs – are enabled by the invention.

Applications

- Wireless communication hardware and/or infrastructure
- Emerging high frequency systems, including centimeter-wave and millimeter-wave systems
- Satellite communications

Key Benefits

- Ideal for consumer products where low cost is key, e.g., handsets and Internet of Things devices
- Compatible with various antenna configurations
- Also applicable to beam-space MIMO systems that are particularly relevant at high frequencies.

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Related Technologies

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- [WARF reference number P110040US01 describes the researcher's compatible transmitter system, known as a continuous aperture phased MIMO \(CAP MIMO\) system.](#)

Related Intellectual Property

- [View Continuation Patent in PDF format.](#)

Tech Fields

- [Information Technology : Networking & telecommunications](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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