



Wideband Transceiver for Antenna Array

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WARF: P150113US01

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in improving the performance of wideband communications using a relatively simple design.

Overview

Wideband high-dimensional antenna arrays are expected to play a key role in future wireless systems. Due to narrow bandwidths, phased array/beamforming methods are the natural choice when it comes to designing multiple-input, multiple-output (MIMO) antenna systems. However, these methods are inadequate as bandwidth and array dimensions increase. In particular the well-known problem of “beam-squint” in which the beam direction changes with frequency can cause very significant degradation in performance.

The Invention

UW–Madison researchers have developed a hardware/software-based solution. Their new method quantifies and corrects degradation due to beam-squint, and introduces several small design changes to beamspace MIMO (B-MIMO) systems.

The researchers identified a channel dispersion factor that can be used to quantify the severity of the problem and to select the beams for maximum performance.

Applications

- Emerging millimeter-wave technology for gigabit backhaul and mobile access
- Emerging satellite communications applications

Key Benefits

- Improves performance
- Outperforms other designs
- Maintains channel power
- Eliminates pulse distortion
- Could be incorporated into existing phased array designs with relatively minor modifications
- Also applicable to new technologies for multi-beamforming, such as continuous aperture phased MIMO (CAP-MIMO)

Stage of Development

Simulations and calculations show this method should work as expected to improve the use of available bandwidth.

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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.](#)

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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