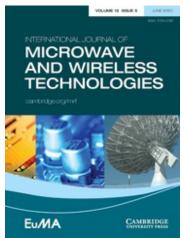
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Experimental investigation of beam-steering applied to 2 × 2 MIMO system with single receiving RF chain and time-modulated antenna array

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GRZEGORZ BOGDAN, KONRAD GODZISZEWSKI, YEVHEN YASHCHYSHYN

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Abstract

Multiple antennas and multiple radio frequency (RF) chains in both the transmitter and receiver are required in conventional radio systems employing the multiple-input multiple-output (MIMO) method. This paper presents an experimental investigation of a beam-steering time-modulated MIMO receiver with a single RF chain. Implementation of the receiver is based on a time-modulated antenna array (TMAA) and a software-defined radio. The sidebands generated inherently by the TMAA are utilized as virtual spatial channels with the beam-steering functionality. Performance of the system is investigated experimentally. The bit error rate and condition number of the channel matrix are examined for different radiation patterns in order to determine favorable configurations in a given multipath environment. Obtained results show a considerable impact of the beam-steering on the performance of MIMO transmission.

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