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PII: S1434-8411(18)30467-9
DOI: https://doi.org/10.1016/j.aeue.2018.06.032
Reference: AEUE 52390

To appear in: *International Journal of Electronics and Communications*

Received Date: 21 February 2018
Accepted Date: 21 June 2018

Please cite this article as: M. Djeddou, F. Berrahma, K. Ghanem, Improved Spectral Efficiency of SM-OFDM Using a Set of Rotated Constellations, *International Journal of Electronics and Communications* (2018), doi: https://doi.org/10.1016/j.aeue.2018.06.032

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# Improved Spectral Efficiency of SM-OFDM Using a Set of Rotated Constellations

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**Abstract**

Spatial Modulation (SM) is a technique that targets to achieve a compromise between the two conflicting objectives in multiple-input multiple-output (MIMO) networks, namely the simultaneous enhancements of data reliability and data rate, by adjusting the index of the operational transmit antenna in the transmitted information bits. Orthogonal frequency division multiplexing (OFDM) has become a widely accepted technique to combat inter-symbol interference (ISI) present in frequency selective channels, such as the ones conveying very high data rates. In this paper, a new SM-OFDM-based scheme is proposed, which adds another element of information in the transmitted SM-data block consisting of a chosen constellation among the available rotated set. To attain this, an additional index is used to select the specific constellation. At the receiver, a set of detectors is proposed to jointly estimate the transmitted symbol, as well as the used constellation and the active transmit antenna indices. The compar-

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