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Separable Decomposition and Quantum Correlations in Toeplitz Matrices

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The manuscript by Mozrzymas et al. (reference: JPhysA-103832) investigates the separability conditions in the case of block-Toeplitz matrices and unfortunately the outcomes do not significantly advance the field of the characterization of quantum correlations in multi-qubit systems. The second part (section III), devoted the quantum discord existing in quantum states having the Toeplitz structure, seems to be heavily dependent on the paper "Circulant States with Vanishing Quantum Discord" by B. Bylicka et al (Open Syst. Inf. Dyn. 19, 1250006 (2012)). The paper is essentially a reformulation of existing results. I do not feel that there is enough relevant material. This is the crucial reason behind my negative assessment and I can not recommend the paper for publication. On the other hand, the authors explain that Toeplitz matrices play an important role in several mathematical and physical fields and mention some applications. However, the generation of quantum states of Toeplitz type seems to be very difficult and I don't know what is the best efficiency scheme to generate them with the present day technology.