Chen, Bocong; Huang, Jing
On unitary Cayley graphs of matrix rings. (English) Zbl 07414983
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Summary: Let $F_q$ be a finite field of order $q$ and let $R$ be a finite commutative local ring which is not a field. Recently, three (resp. four) distinct eigenvalues of the unitary Cayley graph $C_{M_n(F_q)}$ (resp. $C_{M_n(R)}$) have been determined in Rattanakangwanwong and Meemark (2020) [20]. In this paper, completely explicit closed formulas for all the eigenvalues of $C_{M_n(F_q)}$ and $C_{M_n(R)}$ are obtained by using a new approach. As applications, the energy, the Kirchhoff index and the number of spanning trees of $C_{M_n(F_q)}$ and $C_{M_n(R)}$ are derived, respectively.

MSC:
05Cxx Graph theory
05Exx Algebraic combinatorics
05-XX Combinatorics

Keywords:
unitary Cayley graph; matrix ring; eigenvalue; spectrum

References:

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