A Class of Bicyclic Antiautomorphisms of Mendelsohn Triple Systems

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A cyclic triple, (a, b, c), is defined to be the set $\{(a, b), (b, c), (c, a)\}$ of ordered pairs. A Mendelsohn triple system of order v, MTS(v), is a pair (M, β), where M is a set of v points and β is a collection of cyclic triples of pairwise distinct points of M such that any ordered pair of distinct points of M is contained in precisely one cyclic triple of β. An antiautomorphism of a Mendelsohn triple system, (M, β), is a permutation of M which maps β to β^{-1}, where $\beta^{-1} = \{(c, b, a)|(a, b, c) \in \beta\}$. Necessary conditions for the existence of a Mendelsohn triple system of order v admitting an antiautomorphism consisting of two cycles of lengths M and N, where $N > 2M$ have been shown, and in some cases, sufficiency has been shown. We show sufficiency for the case $M \equiv 1 \pmod{24}$ with $N = 6M$.

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