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Blocking sets and maximal strong representative systems in finite projective planes. (English)

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A strong representative system (SRS) is a set of flags of a finite projective plane,

$$B = \{(P_1, r_1), (P_2, r_2), \ldots, (P_k, r_k)\},$$

with the property that $P_i \in r_j$ iff $i = j$. B is maximal if it is maximal with respect to inclusion as a set of flags. Maximal SRS's are a proper generalization of minimal blocking sets. It is shown that in a projective plane of order q, $q + 1 \leq |B| \leq q^{3/2} + 1$ (and the bounds are sharp in the Desarguesian case). Some constructions of maximal SRS's are given.
The paper also contains constructions of minimal blocking sets in $PG(2, q^2)$ by modifying a Hermitian curve, and in $PG(2, q)$, for even q, by selecting three conics in a pencil of conics.

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