
BRETT STEVENS, Carleton University

Affine planes with ovals for blocks

A beautiful theorem states that the reverse of a line in the Singer Cycle presentation of a projective plane is an oval. This implies that for every Desarguesian projective plane there is a companion plane all of whose blocks are ovals in the first. This fact has been exploited to construct a family of very efficient strength 3 covering arrays. We show that there exist pairs of Desarguesian affine planes whose blocks are ovals in the other plane for any order a power of 2. These can also be used to construct efficient covering arrays.