

## **Quasigroups with a Hole of Size 4, 6, 8, or 10**

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When sufficient, quasigroups with holes of size 2 afford us clean and efficient constructions for a variety of pairwise balanced designs; however, there are cases when such constructions for maximum packings and minimum coverings require a hole of size 4 or larger. For such cases, constructions for quasigroups that include a hole of size 4 or larger are presented.

Keywords: quasigroup with holes, latin square, Steiner triple system, pairwise balanced designs, blocks