Row-column factorial designs of strength at least 2

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The q^k (full) factorial design with replication λ is the multi-set consisting of λ occurrences of each element of each q-ary vector of length k; we denote this by $\lambda \times [q]^k$. An $m \times n$ *row-column factorial design* q^k of *strength* t is an arrangement of the elements of $\lambda \times [q]^k$ into an $m \times n$ array (which we say is of type $I_k(m, n, q, t)$) such that for each row (column), the set of vectors therein are the rows of an orthogonal array of size k, degree n (respectively, m), q levels and strength t. Such arrays have been used in practice in experimental design. In this context, for a row-column factorial design of strength t, all subsets of interactions of size at most t can be estimated without confounding by the row and column blocking factors. In this talk we consider row-column factorial designs with strength $t \geq 2$. The constructions presented use Hadamard matrices and linear algebra.