Vu, Van H.
Extremal set systems with weakly restricted intersections. (English) Zbl 0985.05051

In this excellent paper extremal set systems with intersections of restricted cardinality are studied. If, say, each intersection has even cardinality then a linear algebraic tool (linear independence of the characteristic vectors of the subsets) gives an upper bound for the number of subsets. If, for each $i$, the cardinality constraints for $A_i \cap A_j$ can be violated by at most $s$ subsets of form $A_j$ then this “$s$-weak version” of the problem can still be handled by additional tools (from extremal graph theory, for instance) if $s$ is relatively small. The author gives a tight upper bound for the weak version of the “odd town” problem (odd subsets with even intersections); for the weak version of the non-uniform Fisher inequality (leading to a new, extremal set theoretic characterization of Hadamard’s matrices); and for the weak version of the “even town” problem (even intersections only). This latter leads to results in case of restricted multi-intersections as well.

Reviewer: András Recski (Budapest)

MSC:
05D05 Extremal set theory
05B20 Combinatorial aspects of matrices (incidence, Hadamard, etc.)

Keywords:
restricted intersections; extremal sets

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