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EXTREMAL PROBLEM FOR CROSSING VECTORS

Vectors v and u in the lattice Z^w i -cross if there exists a coordinate on which v is i bigger than u and vice versa. The talk is devoted to the following problem: What is the maximal cardinality of a set of vectors that pairwise 1-cross, but not k -cross? This problem has some order theoretic motivation which will be explained. Our conjecture is that the answer is $k^{(w-1)}$. It is true for $w = 1, 2$ and 3. We will show several examples realizing expected number and show proofs of two incomparable upper bounds k^w and $wk^{(w-1)}$.