

István Tomon

ETH Zurich

MINIMAL HYPERPLANE COVERS OF FINITE SPACES AND APPLICATIONS

At least how many hyperplanes are needed to cover the finite space \mathbb{F}_p^n ? Clearly, the answer is p , as one can take p translations of any hyperplane. However, what if we also require that the normal vectors of the hyperplanes span the whole space, and none of the hyperplanes is redundant? This question turns out to be much more difficult, and is related to a number of long-standing conjectures, such as the Alon-Jaeger-Tarsi conjecture on non-vanishing linear maps, the Additive Basis conjecture, and a conjecture of Pyber about irredundant coset covers. I will present some progress on this question, which in particular resolves the first conjecture in a strong form, and the last conjecture as well. This is joint work with János Nagy and Péter Pál Pach.