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A covering lemma and its applications

An entropy lemma states that if we control the diameter of a body on a subspace then we control the covering of the body. More precisely, given two centrally-symmetric bodies K and L , satisfying $K \subset AL$ and $K \cap E \subset aL$ for a k -codimensional subspace E , one has $N(K, 2rL) \leq (4A/(r - a))^k$ for every $r > a$. That means that, surprisingly, the covering numbers of K behave in the same way as the covering numbers of a cylinder with the base $aL \cap E$. We prove this lemma and discuss its applications to the Gelfand numbers and to the Sudakov inequality.

This talk is based on joint works with A. Pajor and N. Tomczak-Jaegermann and with V. Milman, A. Pajor, and N. Tomczak-Jaegermann.