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ALMOST DISJOINT FAMILIES: AN APPLICATION TO LINEAR ALGEBRA*

OREN KOLMAN†

Abstract. Suppose that κ is an infinite cardinal, V is a κ-dimensional vector space over a field F, and A is a family of subspaces of V which is maximal with respect to the property: whenever U and W are distinct members of A, then $U \cap W$ has dimension less than κ. What is the cardinality of A? This expository paper explains how questions about the possible cardinality of A for vector spaces of infinite dimension over countable fields are independent of the axioms of ordinary set theory (ZFC).

Key words. linear algebra, almost disjoint, Martin's axiom, combinatorial set theory, logic

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†King's College London, Strand, London WC2R 2LS, United Kingdom (okolman@member.ams.org).