1015-28-231   **Richard L Oberlin*** (`oberlin@math.wisc.edu`). *The (d, k) Kakeya problem.*

A (d, k) set is a subset of $\mathbb{R}^d$ containing a translate of every k-dimensional plane. The (d, k) problem is to determine the minimum size, in terms of dimension or Lebesgue measure, of a (d, k) set, and to give bounds for related maximal operators. We use the arithmetic combinatorial methods of Katz and Tao to obtain new mixed-norm estimates for the x-ray transform, and we show that these estimates give an improved lower bound for the Hausdorff dimension of (d, k) sets. (Received February 06, 2006)

1