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Joshua N Cooper* (cooper@math.sc.edu), 1523 Greene St., LeConte College, USC, Columbia, SC 29201. *Collinear triple hypergraphs and the finite plane Kakeya Problem.*

We show that the problem of counting collinear points in a permutation (previously considered by the author and J. Solymosi) and the well-known finite plane Kakeya problem are intimately connected. Via counting arguments and by studying the hypergraph of collinear triples we show a new lower bound $5q/14 + O(1)$ for the number of collinear triples of a permutation of $GF(q)$ and a new lower bound $q(q+1)/2 + 5q/14 + O(1)$ on the size of the smallest Besicovitch set in $GF(q)^2$. Several intriguing questions about the structure of the collinear triple hypergraph are presented. (Received November 06, 2006)