Zbl 798.52017
Erdős, Paul; Makai, Endre; Pach, János
Nearly equal distances in the plane. (In English)
Comb. Probab. Comput. 2, No.4, 401-408 (1993). [0963-5483]

The authors prove that for every positive integer k and for every $\varepsilon > 0$ there exist numbers $n_0 > 0$ and $c > 0$ such that every set of $n > n_0$ points in the Euclidean plane in pairwise distances at least 1 has the following property: for arbitrary reals $t_1, \ldots, t_k$, the number of pairs of points whose distance belongs to the set $\bigcup_{i=1}^{k}[t_i, t_i + c\sqrt{n}]$ is at most $(n^2/2)(1 - 1/(k+1) + \varepsilon)$. This bound is asymptotically best possible. The proof generalizes the considerations of the authors and *J. Spencer* [DIMACS, Ser. Discret. Math. Theor. Comput. Sci. 4, 265-273 (1992; Zbl 741.52010)].

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