

# Alternating Hamiltonian cycles with minimum number of crossings in the plane

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## Abstract

Let  $X$  and  $Y$  be disjoint sets of points in the plane such that  $|X| = |Y|$  and no three points of  $X \cup Y$  are on the same line. Then we can draw an alternating Hamiltonian cycle on  $X \cup Y$  in the plane which passes through alternately points of  $X$  and those of  $Y$ , whose edges are straight-line segments, and which contains at most  $|X| - 1$  crossings. Moreover we show that the above upper bound  $|X| - 1$  on crossing number is best possible.

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