

UPPER BOUNDS ON LINKING NUMBERS OF
THICK LINKS

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Abstract

The maximum of the linking number between two lattice polygons of lengths n_1, n_2 (with $n_1 \leq n_2$) is proven to be of the order of $n_1(n_2)^{\frac{1}{3}}$. This result is generalized to smooth links of unit thickness. The result also implies that the writhe of a lattice knot K of length n is at most $26n^{4/3}/\pi$. In the second half of the paper examples are given to show that linking numbers of order $n_1(n_2)^{\frac{1}{3}}$ can be obtained when $n_1^3 \geq n_2$. When $n_1^3 < n_2$, it is further shown that the maximum of the linking number between these two polygons is bounded by cn_1^2 for some constant $c > 0$. Finally the maximal total linking number of lattice links with more than 2 components is generalized to k components.

Key words and phrases: Knots, Links, Linking Number, Lattice Polygons, Lattice Links.