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Distance counting in Tori

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Abstract

Distance counting in closed lattices such as toroids covered by C4C8 and C5C7 faces is presented. Two related ways are considered: (i) counting the Hosoya polynomial, defined as a distance-based increasing power sequence and (ii) counting the Wiener number, the sum of all distances in a graph, available either from the first derivative of the Hosoya polynomial (at x = 1), or calculable from the topological distance matrix. Analytical formulas or recursive relations are given.

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