

Exactly solvable classes of self-avoiding walks

Mireille Bousquet-Mélou

Université Bordeaux 1

A walk on a lattice is self-avoiding if it never visits twice the same vertex. The enumeration of these walks is notoriously difficult, though intriguing conjectures exist on the asymptotic behaviour of the corresponding numbers.

Many authors have thus considered restricted, more tractable families of SAW. We present a short survey of these, from the very simple directed SAW (formed of North and East steps) to the largest class counted so far, namely that of weakly directed self-avoiding walks. We also describe some limit properties of these walks, like their end-to-end distance.

These examples illustrate important tools in enumerative combinatorics, like generating functions, recursive constructions, and singularity analysis.