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Approximants of quasiperiodic structures generated by the inflation mapping. (English)

Zbl 0719.52015

J. Phys. A, Math. Gen. 22, No. 21, 4549-4564 (1989).

Summary: The problem of deriving explicit coordinates for quasicrystal approximants is solved in all the cases where the quasicrystal has an inflation symmetry. In the higher-dimensional space \mathbb{R}^n , from which the quasiperiodic pattern is obtained by the cut method, the inflation symmetry is represented by a hyperbolic modular matrix (with integer entries) leaving the 'physical' space invariant. But this matrix also generates, by iteration, a sequence of (rational) approximant spaces which converges to the irrational space. A simple algorithm is described, providing the approximant periodic lattice and the set of vertices within a unit cell.

MSC:

52C22 Tilings in n dimensions (aspects of discrete geometry)

82D25 Statistical mechanics of crystals

Cited in **3** Documents

Keywords:

aperiodic tiling; quasicrystal approximants; inflation symmetry; quasiperiodic pattern; algorithm

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