Duneau, Michel; Mosseri, Rémy; Oguey, Christophe
Approximants of quasiperiodic structures generated by the inflation mapping. (English)
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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

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

Full Text: DOI