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COLORING OF THE d^{th} POWER OF THE FACE-CENTERED CUBIC GRID

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Abstract

The face-centered cubic grid is a three dimensional 12-regular infinite grid. This graph represents an optimal way to pack spheres in the three-dimensional space. We give lower and upper bounds on the chromatic number of the d^{th} power of the face-centered cubic grid. In particular, in the case $d = 2$ we prove that the chromatic number of this grid is 13. We also determine sharper bounds for $d = 3$ and for subgraphs of the face-centered cubic grid.

Keywords: face-centered cubic grid, d^{th} power of graph, distance coloring.

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