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tion of folding is based on lattice tiling and a direction in the D -dimensional grid. There are potentially $(3^D - 1)/2$ different folding operations. Necessary and sufficient conditions that a lattice combined with a direction

ne a folding are derived. The immediate and most impressive application is some new lower bounds on the number of dots in two-dimensional synchronization patterns. This can be also generalized for multidimensional synchronization patterns. It is also shown how folding can be used to construct multidimensional error-correcting codes. Finally, multidimensional pseudo-random arrays with various shapes are generated. Algebra and Number Theory