

Will it k-tile? Structural aspects of polytopes and lattices in multiple tiling

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We describe extensions of previous work on k -tilings in four different directions. First, we provide flexible visualization tools for k -tilers in two and three dimensions. Next, we apply Bolle's combinatorial characterization of k -tiling polygons in two dimensions to give more "constructive" and computationally-checkable conditions for a polygon to k -tile by an (unspecified) lattice. Third, we extend Bolle's characterization to three dimensions and indicate a path towards obtaining an analogue of our conditions in this case. Finally, we use similar ideas to prove a structure result for k -tilers in arbitrary dimension.