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Robert M. Erdahl* (erdahlr@post.queensu.ca, kr57@cornell.edu), Dept. of Mathematics & Statistics, Queen's University, Kingston, Ontario K7L 3N6, Canada. *Minkowski sums of Voronoi Polytopes and Commensurate Delaunay Tilings*. Preliminary report.

It is natural to ask whether the Voronoi polytope for a lattice can be written as the Minkowski sum of polytopes, which in turn are Voronoi polytopes for lattices. It turns out that this is possible if and only if the corresponding Delaunay tiling can be represented as the intersection of two commensurate lattice tilings, one for each of the summands. This Structure Theorem is the main result that will be reported, and generalizes an earlier result of S. S. Ryshkov. The Minkowski sum of two polytopes is well-known in convexity theory, but the notion of commensurate lattice tilings is new. This notion will be explained in the context of Voronoi's famous theory of lattice types. I will illustrate the content of the Structure Theorem for the case where the Voronoi polytope is a zonotope, so is the Minkowski sum of line segments. In this case, the dual tiling has a particularly simple representation, as the intersection of commensurate tilings where all tiles are translates of an infinite slab. These tilings are called dicings. (Received October 03, 2000)