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Fu Liu* (fuliu@math.ucdavis.edu), One Shields Avenue, Davis, CA 95616. *Higher integrality conditions and volumes of slices.*

A polytope is integral if all of its vertices are lattice points. The constant term of the Ehrhart polynomial of an integral polytope is known to be 1. I generalize this result by introducing the definition of k -integral polytopes, where 0-integral is equivalent to integral. I will show that the Ehrhart polynomial of a k -integral polytope P has the properties that the coefficients in degrees of less than or equal to k are determined by a projection of P , and the coefficients in higher degrees are determined by slices of P . A key step of the proof is that under certain generality conditions, the volume of a polytope is equal to the sum of volumes of slices of the polytope. (Received September 12, 2010)