1038-19-112 **Joseph Gubeladze*** (soso@math.sfsu.edu), Department of Mathematics, San Francisco State University, 1600 Holloway Ave., San Francisco, CA 94132. *Nil-groups, convex geometry, and discrete geometry.*

Nil-groups of a ring measure the failure of K-homotopy invariance with respect to polynomial extensions. Polynomial extensions correspond to positive orthants in real Euclidean spaces. By extending the orthogonal cones to arbitrary ones and allowing non-affine varieties, one is naturally led to toric varieties. The naive analogue of Quillen's theorem on homotopy invariance of regular schemes fails badly for non-regular toric varieties. Our result, derived by a combination of convex geometry and K-theoretic techniques, is that the obstruction to K-homotopy invariance of toric varieties is killed by high iterations of natural Frobenius type endomorphisms. Recently, Cortinas-Haesemeyer-Walker-Weibel gave a new shorter proof, where convex geometry plays no important role. However, convex discrete geometry (i. e. interaction of convex shapes with the integer lattice) may hold key to deeper understanding of the K-theory of toric varieties. (Received February 03, 2008)