Meeting: 999, Nashville, Tennessee, SS 5A, Special Session on Topological Aspects of Group Theory

999-55-85 **Jerzy None Dydak*** (`jdydak@utk.edu`), Dept of Math, UTK, Knoxville, TN 37996. *Algebras derived from dimension theory.*

The dimension algebra of graded groups is introduced. With the help of known geometric results of extension theory that algebra induces all known results of the cohomological dimension theory. Elements of the algebra are equivalence classes $\dim(A)$ of graded groups A. There are two geometric interpretations of those equivalence classes: 1. For pointed CW complexes K and L, $\dim(H_*(K)) = \dim(H_*(L))$ if and only if the infinite symmetric products $SP(K)$ and $SP(L)$ are of the same extension type (i.e., $SP(K) \in AE(X)$ iff $SP(L) \in AE(X)$ for all compact X). 2. For pointed compact spaces X and Y, $\dim(\mathcal{H}^{-*}(\mathcal{X})) = \dim(\mathcal{H}^{-*}(\mathcal{Y}))$ if and only if X and Y are of the same dimension type.

Dranishnikov's version of Hurewicz Theorem in extension theory becomes $\dim(\pi_*(K)) = \dim(H_*(K))$ for all simply connected K.

The concept of cohomological dimension $\dim_A(X)$ of a pointed compact space X with respect to a graded group A is introduced. It turns out $\dim_A(X) \le 0$ iff $\dim_{A(n)}(X) \le n$ for all $n \in Z$. If A and B are two positive graded groups, then $\dim(A) = \dim(B)$ if and only if $\dim_A(X) = \dim_B(X)$ for all compact X. (Received August 12, 2004)