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John D Foley* (jfoley@ucsd.edu). *Comparing Kac-Moody Groups over \mathbb{C} and Finite Fields via Homotopy Theory.*

A new homotopy decomposition for the positive “unipotent” subgroup, U^+ , of a group with a RGD system is presented in this talk. As an application, a map $BK(\overline{\mathbb{F}}_p) \rightarrow BK$ is constructed for a complex Kac-Moody group K and the discrete Kac-Moody group $K(\overline{\mathbb{F}}_p)$ over \mathbb{F}_p of the same type by using known homotopy decompositions to employ the previously studied Lie case. This new map is a \mathbb{F}_p -homology isomorphism in analogy to the Lie case appearing in Friedlander, Eric M. and Mislin, Guido *Cohomology of classifying spaces of complex Lie groups and related discrete groups.* Comment. Math. Helv. 59 (1984), no. 3, 347–361. If K is a reductive Lie group, localizing at a prime $q \neq p$ and taking homotopy fixed points with respect to p^k -th unstable Adams operation, ψ^k , recovers the maps $BK(\mathbb{F}_{p^k})_q^\wedge \rightarrow (BK^{h\psi^k})_q^\wedge$ Friedlander and Mislin used to construct $BK(\overline{\mathbb{F}}_p) \rightarrow BK$ for reductive Lie groups. Here, cohomology calculations are given to compare $(BK^{h\psi^k})_q^\wedge$ and $BK(\mathbb{F}_{p^k})_q^\wedge$ for some rank two, non-Lie examples. (Received September 22, 2010)