Meeting: 1004, Bowling Green, Kentucky, SS 14A, Special Session on Geometric Topology and Group Theory

1004-57-259 **Nancy Waller*** (beylf@pdx.edu), Dept. of Mathematics & Statistics, Portland State University, P.O. Box 751, Portland, OR 97207-0751, and **F. Rudolf Beyl**. *The geometric realization problem of algebraic 2–complexes.* Preliminary report.

For finite groups G, a positive answer to Wall's D_2-problem is equivalent to showing that all chain homotopy classes of algebraic 2–complexes over G are geometrically realizable [1]. An algebraic homotopy type is geometrically realizable if there is a member $\mathcal{A}$ of this class that realizes a presentation of G, i.e., $\mathcal{A}$ can be viewed as the cellular chain complex $C(\widetilde{K})$ of the universal cover of a presentation complex K for G. This requires free modules and identifying preferred bases in dimensions $0-2$. For a counterexample, it is necessary to prove that no member of this class realizes a presentation of G. In order to reduce the problem, we discuss transformations of algebraic 2–complexes, analogous to the usual rewriting processes for group presentations, such that the property of realizing a presentation is preserved.

[1] F. E. A. Johnson, *Stable Modules and the* D(2)–*Problem,* London Math. Soc. Lecture Note Ser. vol. 301, Cambridge University Press, Cambridge, 2003. (Received January 25, 2005)