

**Meeting:** 1003, Atlanta, Georgia, SS 24A, AMS Special Session on Design Theory and Graph Theory, I

1003-05-97            **Oliver Gjoneski\*** (ogjonesk@bates.edu), Oliver Gjoneski, 292 Bates College, Lewiston, ME 04240, and **Ken W Smith** (ken.w.smith@cmich.edu), Ken W. Smith, Department of Mathematics, Central Michigan University, Mt. Pleasant, MI 48859. *On the nonexistence of a  $(176, 50, 14)$  difference set.*

The Higman-Sims symmetric design with parameters  $(176, 50, 14)$  is an important combinatorial structure of interest to mathematicians because of its large sporadic automorphism group, in addition to the recently discovered rich tight subdesign structure. The existence of the Higman-Sims design raises the question as to the existence of a difference set with these parameters. The search for a difference set with these parameters historically has focused on the five abelian groups of order 176, and even then the results have been difficult. The connection of a nonabelian simple group with these parameters suggests that one should look more carefully at the remaining 37 nonabelian groups of order 176. We will use a wide array of techniques to eliminate the possibility of a difference set in all the groups of order 176. (Received August 04, 2004)