Meeting: 1005, Newark, Delaware, SS 9A, Special Session on Arithmetic Groups and Related Topics

1005-22-76 **Herbert Abels*** (abels@mathematik.uni-bielefeld.de), Universitaet Bielefeld, Fakultaet fuer Mathematik, Postfach 100131, D-33501 Bielefeld, Germany. *A question of Siegel*

Let $\Gamma = SL(n,\mathbb{Z})$ and $G = SL(n,\mathbb{R})$. The main result of reduction theory describes a fundamental set S for Γ in G, i.e. a subset S of G such that the natural map $G \to \Gamma\backslash G$ restricted to S, let us call it $\pi\colon S \to \Gamma\backslash G$, is surjective and has finite fibers. The set S described in reduction theory is called a Siegel set. Siegel asked in 1959 if π has the additional property of preserving the natural metric up to a constant. In recent work with G.A. Margulis we gave a positive answer to this question. Our solution has three interesting features:

1. It works for all reductive groups G over local fields and their corresponding arithmetic subgroups Γ. Positive answers to Siegel's question had been known before for reductive groups over the reals and their arithmetic subgroups (Ding, Ji, Leuzinger).

2.It works for all norm-like metrics, not only for the metrics coming from the symmetric spaces (as considered by the authors above) or from the Bruhat-Tits building, but also for word metrics.

3. The proof gives additional information in reduction theory. (Received January 28, 2005)