1023-54-1836 **Bojana Pejic*** (bop4@pitt.edu), Department of Mathematics, 301 Thackeray Hall, Pittsburgh, PA 15260, and **Paul Gartside**. *Uniqueness of Polish group topologies.* Preliminary report.

A key problem in the theory of Polish (separable completely metrizable topoplogical) groups is that of the Automatic Continuity: When can we conclude that a homomorphism between two Polish groups must be continuous? This problem is related to another question: When does a Polish group admit only one Polish group topology?

A convenient method for proving that a group has a unique Polish group topology is to apply a theorem of Mackey: If G is a topological group, with a countable point-separating family of sets that are Borel in *any* Polish group topology on G, then G has a unique Polish group topology.

This problem inspired the following questions: 1) Algebraically definable sets are analytic; are they, in fact, always Borel? 2) If not, can Mackey's result be improved to work with analytic sets?

In this talk I'll give an example of a set defined algebraically that is analytic but not Borel, showing that not all algebraically defined sets are Borel. Time permitting, I will talk about some difficulties in extending the Mackey's result. (Received September 27, 2006)