1014-14-1146 **Nicole M.A. Lemire*** (nlemire@uwo.ca), Department of Mathematics, University of Western Ontario, London, Ontario N6A 5B7, Canada. *Cayley Maps and Cayley Degrees for Algebraic Groups.* Preliminary report.

An algebraic group G is called *Cayley* if there exists a birational isomorphism between G and its Lie algebra $\mathcal{G}$ which is equivariant with respect to the conjugation action of G on itself and the adjoint action of G on $\mathcal{G}$. Cayley was the first to construct such a birational isomorphism for $\mathrm{SO_n}$. Luna asked whether or not maps with these properties can be constructed for other algebraic groups. We proved in earlier work that the answer to Luna's question is usually "no" with a few exceptions. In particular, a Cayley map for the group $\mathrm{SL_n}$ exists if and only if $n \leq 3$. The negative results were proved by methods of integral representation theory. We now examine bounds on the *Cayley degree* of an algebraic group, a measure of the obstruction for an algebraic group to be Cayley. This is joint work with Vladimir Popov and Zinovy Reichstein. (Received September 27, 2005)