

1007-22-230

K. A. Brown, K. R. Goodearl and Milen Yakimov* (yakimov@math.ucsb.edu), Department of Mathematics, UCSB, Santa Barbara, CA 93106. *Dual Schubert cells in full flag varieties and Poisson geometry.*

The affine space of $m \times n$ complex matrices possesses a complex algebraic Poisson structure, invariant under the natural action of an $m + n$ dimensional complex torus T , which recently appeared in works in ring theory and cluster algebras. We will show that the T -orbits of symplectic leaves of this Poisson structure are smooth, connected locally closed subsets which are biregularly isomorphic to intersections of dual Schubert cells. We will further identify the poset of such orbits of leaves (under the inclusion of closures relation) with a subset of S_{m+n} of permutations under the Bruhat order (e.g for $m = n$ this is the subset of permutations that move indices by at most n position, with the inverse Bruhat order). We will also describe explicit determinantal formulas for the ideals defining the closures of orbits. At the end we will discuss a complex algebraic Poisson structure on the full flag variety of any complex simple Lie group whose torus orbits of symplectic leaves are exactly all intersections of dual Schubert cells. (Received February 22, 2005)