

1125-22-1046

Mark Colarusso* (colarusso@uwm.edu). *The Gelfand-Zeitlin integrable system on complex orthogonal Lie algebras.* Preliminary report.

Kostant and Wallach introduced the Gelfand-Zeitlin (GZ) integrable system on $\mathfrak{gl}(n, \mathbb{C})$ and studied the Lagrangian flows and generic fibres of the moment map of the system. In this talk, we discuss the analogous integrable system on $\mathfrak{g} = \mathfrak{so}(n, \mathbb{C})$. We study the geometry of this integrable system by studying the adjoint action of the symmetric subgroup $K = SO(n-1, \mathbb{C})$ on \mathfrak{g} . We use the theory of K -orbits on the flag variety of \mathfrak{g} to describe the nilfibre of the geometric invariant theory quotient $\mathfrak{g} \rightarrow \mathfrak{g}/K$. Using our description of the nilfibre and the Luna slice theorem, we develop an analogue of the classical Jordan decomposition for the K -action on \mathfrak{g} and use it to describe the points in the moment map fibres of the GZ integrable system where the flows are Lagrangian. If time permits, we will briefly discuss our approach to understanding the geometry of the moment fibres at singular points of the integrable system using the theory of flat deformations of schemes. This is joint work with Sam Evens. (Received September 14, 2016)