Meeting: 1003, Atlanta, Georgia, SS 23A, AMS Special Session on Representations of Lie Algebras, I

1003-15-1569 **Garret E. Sobczyk*** (sobczyk@mail.udlap.mx), Departamento de Fisica & Matematicas, Universidad de Las Americas-Puebla, 72820 Cholula, Puebla, Mexico. *Bivector Lie Algebra in (Clifford) Geometric Algebra.* Preliminary report.

Any square n-matrix over the field of real or complex numbers can be represented in terms of a corresponding bivector in the (Clifford) geometric algebras $G_{n,n}$ or $G_{n,n+1}$, respectively, where the commutator product of two matrices corresponds to the commutator product of the corresponding bivectors in the geometric algebra. It follows that any Lie algebra of the general linear group can be represented in terms of a corresponding Lie algebra of bivectors under the commutator product. The purpose of this paper is to study the basic properties of Lie algebras in terms of the richer algebraic structure of bivectors in the underlying geometric algebra. For example, appropriate projection operators can introduced to project the Lie algebra gl_n into $spin^+_{p,q}$ where $n = p + q$. (Received October 05, 2004)