

1145-VV-891      **Hassan Almusawa\*** ([almusawah@vcu.edu](mailto:almusawah@vcu.edu)), 301 Karl Linn Drive, Apt. 215, North Chesterfield, VA 23225. *Symmetry Algebras of the Canonical Lie Group Geodesic Equations in Dimension Five*. Preliminary report.

Geodesic equations of the canonical Lie group connection have recently appeared in the context of the inverse problem of Lagrangian mechanics. Our research main goal is to investigate the Lie symmetry properties of the canonical geodesic system and it is confined to the five-dimensional indecomposable Lie groups. In this talk, I will discuss the Lie symmetry properties for the algebra  $A_{5,19}^{ab}$ . For such algebra, an over-determined system of linear PDEs of its associated system of geodesics will be provided and described. In addition, a basis for the associated Lie algebra of symmetries as well as the corresponding non-zero Lie brackets are constructed and classified.

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