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**Seunghun Hong\*** ([hong@math.psu.edu](mailto:hong@math.psu.edu)), Department of Mathematics, Pennsylvania State University, University Park, PA 16802. *A Lie-Algebraic Approach to the Local Index Theorem on a Flag Variety.*

Let  $G$  be a compact Lie group and let  $T$  be a maximal torus in  $G$  (more generally we could consider any connected closed subgroup). Using a  $K$ -theory point of view, Bott related the Atiyah-Singer index theorem for elliptic operators on  $G/T$  to the Weyl character formula. In this talk we shall explain how to prove the *local* index theorem on  $G/T$  using Lie algebra methods. Our method follows in outline the proof of the local index theorem due to Berline and Vergne. But our use of Kostant's cubic Dirac operator in place of the Riemannian Dirac operator leads to substantial simplifications. An important role is also played by the quantum Weil algebra of Alekseev and Meinrenken. (Received September 21, 2011)