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**Shrawan Kumar\***, University of North Carolina, Department of Mathematics, Chapel Hill, NC 27599. *Eigenvalue problem for Hermitian matrices and its generalization to arbitrary reductive groups.*

Apart from being a general survey of the area, my talk is a report on my joint work with P. Belkale. We define a new commutative and associative product in the cohomology of any flag variety  $G/P$  (which still satisfies the Poincaré duality) and use this product to generate certain inequalities which solves the analog of the classical Hermitian eigenvalue problem for any complex semisimple group  $G$ . Our recipe provides considerable improvement, in general, over the set of inequalities defined by Berenstein-Sjamaar. The talk will be accessible to general mathematical audience. (Received April 27, 2006)