

1067-42-2307

**Sanjiv Kumar Gupta\*** (gupta\_s\_63@yahoo.com), PO BOX-36, Al-Khodh, 123 , Oman.

*Dichotomy Conjecture on Compact Symmetric Spaces.*

We prove that for any classical, compact, simple, connected Lie group  $G$ , the  $G$ -invariant orbital measures supported on non-trivial conjugacy classes satisfy a **surprising  $L^2$ -singular dichotomy**: For any natural number  $k$ , either  $\mu_h^k \in L^2(G)$  or  $\mu_h^k$  is singular to the Haar measure on  $G$ . The minimum exponent  $k$  for which  $\mu_h^k \in L^2$  is specified; it depends on Lie properties of the element  $h \in G$ . As a corollary, we complete the solution to a classical problem-to determine the minimum exponent  $k$  such that  $\mu^k \in L^1(G)$  for all central, continuous measures  $\mu$  on  $G$ . Generalisation of this  **$L^2$ -singular dichotomy** to compact symmetric spaces will also be discussed. This is joint work with Prof. K. Hare at the University of Waterloo, Canada. (Received September 22, 2010)