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S. Mehdi, P. Pandžić, D. A. Vogan and R. Zierau* (roger.zierau@okstate.edu). *Dirac Index and Associated Cycles*. Preliminary report.

A conjecture of Mehdi, Pandžić and Vogan relates the Dirac index and the associated cycle for certain Harish-Chandra modules. Suppose (i) G is a complex group, (ii) K is the fixed points of an involution, and (iii) $\text{rank}(K) = \text{rank}(G)$. The equal rank condition allows one to define an invariant, $DI(X)$, of a Harish-Chandra module X known as the Dirac index. The associated cycle is another invariant of X ; it is a formal sum $AC(X) = \sum m_i(X) \cdot [\bar{\mathcal{O}}_i]$, where the \mathcal{O}_i are nilpotent K -orbits in $(\mathfrak{g}/\mathfrak{k})^*$ and each $m_i(X)$ is an integer. The conjecture states that for a certain complex nilpotent G -orbit $\mathcal{O} \subset \mathfrak{g}^*$ (of particular interest), there exist integers c_i so that

$$DI(X) = \sum c_i m_i(X)$$

for all X whose annihilator has associated variety $\bar{\mathcal{O}}$.

The lecture will give an outline of a proof of the conjecture. Some comments will also be made on the computation of the constants. (Received January 19, 2016)