1043-22-34 **David Vogan*** (dav@math.mit.edu), Room 2-243, MIT, 77 Massachusetts Ave., Cambridge, MA 02139. *Branching laws for representations of real reductive groups.* Preliminary report.

Suppose G is a real reductive Lie group, and K is a maximal compact subgroup. If I is a "standard" representation of G then one can write

$$I|_K = \sum_{\mu \in \widehat{K}} m(\mu, I)\mu,$$

with $m(\mu, I)$ a non-negative integer. I will discuss the problem of computing these integers. In principal this problem was solved more than thirty years ago. The ingredients are Kostant's branching law for representations of compact Lie groups, and Hecht and Schmid's proof of Blattner's conjecture (which treats the case when I is a discrete series representation). Mostly because of the appearance of disconnected compact groups, it is difficult to translate these ideas into a computer program. I will discuss a way to do that in principle, and describe work by Alfred Noel and Marc van Leeuwen to implement it.

Here is a special case that illustrates the difficulties: given an irreducible representation μ of the special orthogonal group $K = SO(n)$, calculate the restriction of μ to the subgroup $M = S(O(1)^n)$ of diagonal matrices (a product of $n-1$ copies of $\mathbb{Z}/2\mathbb{Z}$). What makes this problem difficult is that M cannot be extended to a maximal torus of K. (Received July 25, 2008)