1048-22-70 **Jeffrey Adams**, **Marc van Leeuwen**, **Peter Trapa** and **David A. Vogan***
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Kazhdan-Lusztig polynomials for signatures. Preliminary report.

Suppose G is a real reductive Lie group. One of the classical problems in representation theory is to describe completely the set $\widehat{G}_u$ of irreducible unitary representations of G. There are still complete answers only for some special cases.

We will discuss work in progress aimed at creating and implementing an algorithm to solve this problem: a computer program that, for any particular G, can calculate $\widehat{G}_u$. The work is based on ideas of Wai Ling Yee, who solved an analogous problem for highest weight representations of reductive Lie algebras. As with Yee's work, the main tool is a generalization of Kazhdan-Lusztig polynomials, designed to carry information about signatures of invariant Hermitian forms (in the same way that classical Kazhdan-Lusztig polynomials carry information about characters of representations). (Received January 22, 2009)