

© 2011 Heldermann Verlag
Journal of Lie Theory 21 (2011) 847–860

H. He

Dept. of Mathematics, Louisiana State University, Baton Rouge, LA 70803, U.S.A.
hongyu@math.lsu.edu

Unitary Representations and the Heisenberg Parabolic Subgroup

We study the restriction of an irreducible unitary representation π of the universal covering $\widetilde{Sp}_{2n}(\mathbb{R})$ to a Heisenberg maximal parabolic subgroup \tilde{P} . We prove that if $\pi|_{\tilde{P}}$ is irreducible, then π must be a highest weight module or a lowest weight module. This is in sharp contrast with the $GL_n(\mathbb{R})$ case. In addition, we show that for a unitary highest or lowest weight module, $\pi|_{\tilde{P}}$ decomposes discretely. We also treat the groups $U(p, q)$ and $O^*(2n)$.

Keywords: Parabolic subgroups, Heisenberg group, Mackey analysis, branching formula, unitary representations, Kirillov Conjecture, symplectic group, highest weight module.

MSC: 22E45, 43A80