

LOCAL THETA LIFTS OF UNITARY LOWEST WEIGHT MODULES TO THE INDEFINITE ORTHOGONAL GROUPS

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In this talk, I will discuss the local theta lifts of unitary lowest weight modules of $\mathrm{Sp}(2p, \mathbb{R})$ to the indefinite orthogonal group $\mathrm{O}(n, m)$. In a previous paper, Nishiyama and Zhu computed the associated cycles when the dual pair $\mathrm{Sp}(2p, \mathbb{R}) \times \mathrm{O}(m, n)$ lies in the stable range, ie. $2p \leq \min(m, n)$. In this talk, I will report on a joint work with Jiajun Ma and U-Liang Tang at NUS where we extend the computation beyond the stable range. Our approach is to analyze the coherent sheaves generated by the graded modules. We will also need the Kobayashi's projection formula for discretely decomposable restrictions. Our study produces some interesting formulas on the K -types of the representations. In particular for some of these representations, the K -types formulas agree those in a conjecture of Vogan on the unipotent representations.

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