The Hong Kong University of Science and Technology

Department of Mathematics

PhD THESIS EXAMINATION

Weil Representations for Twisted Loop Groups, Type II Theta Liftings for Loop Groups, and the Kac-Moody Correction Factor

By

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ABSTRACT

In this thesis, we discuss three works related to automorphic forms on Kac-Moody groups. In the first work, we first give a symplectic realization of twisted loop groups of type $A_n^{(2)}$ $(n \geq 2)$, then we compute the corresponding Weil representations, and realize this representation as a representation of the metaplectic cover of the corresponding Kac-Moody group constructed by Patnaik-Puskas. In the second work, we computed the theta lifting of the $(\mathrm{GL}_n, \mathrm{GL}_n)$ dual pair of loop groups, starting from a function induced by a classical cuspidal automorphic form on GL_n, and we explain the result as a certain Eisenstein series induced from a maximal parabolic subgroup of the loop GL_n group. In the third work, we proved that the inverse of the Kac-Moody correction factor, a certain formal power series associated to a Kac-Moody root system, converges to a holomorphic function on the interior of the complexified Tits cone.

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The student's thesis is now being displayed on the reception counter in the General Administration Office (Room 3461).