

On $\widehat{\mathfrak{gl}(2|2)^{(2)}}_k$ Current Superalgebra and Twisted Conformal Field Theory

DING Xiang-Mao,¹ WANG Gui-Dong,^{1,2} and WANG Shi-Kun^{1,3}

¹ Institute of Applied Mathematics, Academy of Mathematics and Systems Science, the Chinese Academy of Sciences, P.O. Box 2734, Beijing 100080, China

² Graduate School of the Chinese Academy of Sciences, Beijing 100049, China

³ KLMM, AMSS, CAS, Beijing 100080, China

(Received: 2006-3-17; Revised:)

Abstract: Motivated by the recently discovered hidden symmetry of the type IIB Green-Schwarz superstring on certain background, the non-semisimple Kac-Moody twisted superalgebra $\widehat{\mathfrak{gl}(2|2)^{(2)}}_k$ is investigated by means of the vector coherent state method and boson-fermion realization. The free field realization of the twisted current superalgebra at general level k is constructed. The corresponding Conformal Field Theory (CFT) has zero central charge. According to the classification theory, this CFT is a nonunitary field theory. After projecting out a $U(1)$ factor and an outer automorphism operator, we get the free field representation of $\widehat{\mathfrak{psl}(2|2)^{(2)}}_k$, which is the algebra of $\widehat{\mathfrak{gl}(2|2)^{(2)}}_k$ modulo the Z_4 -outer automorphism, the CFT has central charge -2 .

PACS: 11.25.Hf, 02.20.-a, 11.30.Pb, 05.50.+q

Key words: superalgebra, differential operator realization, free field realization, conformal field theory

[\[Full text: PDF\]](#)

Close