

Zhu's C_2 -algebra of parafermion vertex operator algebras

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Abstract

We consider the commutant V of a Heisenberg algebra in a level k simple affine vertex operator algebra $L(k, 0)$ of type A_1 , where k is an integer greater than 4. Such a V is called a parafermion vertex operator algebra. Its central charge is $2(k-1)/(k+2)$. It is known that V is strongly generated by four vectors W^2 , W^3 , W^4 and W^5 with weight 2, 3, 4 and 5, respectively. Here W^2 is the conformal vector. We study a singular vector u related to a singular vector of $L(k, 0)$ and its image under the weight 1 operator W_1^3 associated with the weight 3 vector W^3 to obtain an upper bound of the dimension of Zhu's C_2 -algebra $V/C_2(V)$ of the parafermion vertex operator algebra V .