Modular Constraints on Conformal Field Theories with Currents

Jin-Beom Bae

Korea Institute for Advanced Study

Abstract

In this poster, we will present how the modular property constraints partition function of two-dimensional conformal field theories(CFT). We apply the semi-definite programming to the modular constraints with assuming the presence of holomorphic/anti-holomorphic currents and twist gap in spectrum. We find that the level-one WZW models with Degline's exceptional series, cousins of extremal CFTs and novel c=8 and c=16 CFTs without Kac-Moody symmetry are realized on the numerical boundary. Strikingly, it turns out that the modular constraints determine the degeneracies of primary states, also the partition function of theories on the numerical boundary. We extend the above analysis by imposing W-algebra or N=1, N=2 super-Virasoro algebra.