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Umbral symmetry groups and K3 CFTs

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Umbral moonshine is a connection between mock modular forms and discrete symmetry groups which arise as automorphisms of the Niemeier lattices, the 24-dimensional unimodular lattices labeled by their ADE root systems. The first example of Umbral moonshine was originally discovered by Eguchi, Ooguri, Tachikawa when expanding the elliptic genus of a K3 surface into $N=4$ characters and seeing coefficients which are sums of irreducible representations of the sporadic group M_{24} . In recent work with Miranda Cheng, we have suggested that all umbral symmetry groups may have some relation to K3 CFTs. On the other hand, a theorem of Gaberdiel, Hohenegger, and Volpato has shown that symmetries of K3 CFTs can naturally be classified by elements of the group Conway_0 , the automorphism group of the Leech lattice, which preserve a four-plane. In this talk we briefly review the aforementioned results, and discuss the extension of this theorem a) to singular CFTs, in which case the role of Conway_0 is naturally replaced by certain umbral groups, and b) when one takes worldsheet parity into account. Based on [ArXiv:1406.0619, 1512.04942], and work to appear with Miranda Cheng and Roberto Volpato

Summary

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