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Title: Commutants in Vertex Operator Algebras

Abstract: In nice conformal field theories, the full Hilbert space of states is expected to decompose as a direct sum of tensor products of (Hilbert space completions of) modules for a commuting pair of vertex operator algebras. This motivates the study of vertex operator algebras that contain commuting pairs of subalgebras. A simpler problem is to study a vertex operator algebra V acted on by a compact group of automorphisms. When V is simple, a theorem of Dong-Li-Mason states that

$$V = \bigoplus_{\chi \in \hat{G}} M_\chi \otimes V_\chi$$

as a $G \times V^G$ module, where M_χ is the irreducible G-module corresponding to a character χ, and the V_χ are (non-zero) distinct irreducible representations of V^G, the G-fixed-point vertex operator subalgebra. In this talk, I will discuss a new theorem establishing an equivalence of symmetric tensor categories between $\mathrm{Rep}\, G$ and the category generated by the V_χ, assuming only that the V_χ are contained in a braided tensor category of V^G-modules.