

Contents

Chapter 1. Introduction	1
1.1. Vertex tensor categories	2
1.2. Motivation	5
1.3. Results on vertex operator (super)algebra extensions and their modules	7
1.4. Tensor categories of regular vertex operator superalgebras	10
1.5. Verlinde formulae for regular $\frac{1}{2}\mathbb{Z}$ -graded vertex operator superalgebras	12
1.6. Outline	18
Chapter 2. Tensor Categories and Supercategories	19
2.1. Commutative associative algebras in braided tensor categories	19
2.2. Superalgebras in braided tensor categories	23
2.3. Tensor products and unit isomorphisms in $\text{Rep } A$	33
2.4. Categorical intertwining operators and a universal property of tensor products in $\text{Rep } A$	42
2.5. Associativity of categorical $\text{Rep } A$ -intertwining operators and the tensor product in $\text{Rep } A$	44
2.6. The braided tensor category $\text{Rep}^0 A$	50
2.7. Induction and restriction functors	56
2.8. More properties of $\text{Rep } A$ and the induction functor	64
Chapter 3. Vertex Tensor Categories	75
3.1. Modules and intertwining operators	75
3.2. Multivalued functions, intertwining maps, and compositions of intertwining operators	80
3.3. An exposition of vertex tensor category constructions	85
3.4. Complex analytic formulation of categorical $\text{Rep } A$ -intertwining operators	95
3.5. Vertex tensor category structure on $\text{Rep}^0 A$	101
3.6. Induction as a vertex tensor functor	113
3.7. Some analytic lemmas	118
Chapter 4. Applications	127
4.1. Examples of vertex operator superalgebra extensions	127
4.2. Verlinde formulae	137
4.3. Cosets by lattice vertex operator algebras: General results	153
4.4. Coset theories: Examples	161
Bibliography	173