CORRELATORS FOR NON-SEMISIMPLE CONFORMAL FIELD THEORIES

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Given a modular finite ribbon category D, by work of Lyubashenko one can associate to any punctured surface M a functor Bl_M from a tensor power of D to the category of finite-dimensional vector spaces. The so obtained vector spaces $Bl_M(-)$ carry representations of the mapping class groups $Map(M)$ and are compatible with sewing, in much the same way as the spaces of conformal blocks of a rational conformal field theory.
I will present a natural construction which, given any object F of D, selects vectors in all space $Bl_M(F, ..., F)$ (i.e. when all punctures on M are labeled by F). If and only if the object F carries a structure of a 'modular' commutative symmetric Frobenius algebra in D, the vectors obtained this way are invariant under the mapping class group actions and are mapped to each other upon sewing. Thereby they are natural candidates for the bulk correlators of a conformal field theory with bulk state space given by F.
If $D = Z(C)$ is a center, then a natural candidate for a bulk state space F is obtained via the central monad on C. If in addition C is the category of modules over a finite-dimensional factorizable Hopf algebra, then several statements can be proven which are still open in the general case.