Galindo: Turaev-Viro-Ocneanu Invariant and Crossed Products between Fusion Categories

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* Tensor Categories
* Actions between tensor categories
* The crossed product category and the equivariant category.
* Relation with TVO.

<u>Definition</u> Monoidal categories, associators, The pentagon identity.
"strict monoidal categories" $\Leftrightarrow$ The associator is the identity.

<u>Thm</u> (MacLane) Every monoidal category is monoidally equivalent to a trivial one.

<u>Def</u> A tensor category is a k-linear Abelian semi-simple category for which the bifunctor $\otimes : \mathcal{C} \times \mathcal{C} \to \mathcal{C}$ is exact.

<u>Example</u> G a group $w \in Z^3(G, k^*)$, that is,

$$w(h,k,l)\,w(g,hk,l)\,w(g,h,k) = w(gh,k,l)\,w(g,h,kl)$$

Let Vec_w^G be the category of G-graded finite vector spaces....

Semi-simple tensor categories are related to
* Semi-simple Hopf algebras
* Low dimensional topology (1D ⊂ 3D)

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* Subfactor Theory.
* Conformal Field Theory.

$\mathcal{C} = \{A, B, C \ldots\}$
$\mathcal{D} = \{\alpha, \beta, \gamma \ldots\}$
monoidal catagories

An action of $\mathcal{D}$ on $\mathcal{C}$ is a functor

$$\triangleright : \mathcal{D} = \mathrm{End}_{\otimes} \mathcal{C}$$

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Ref:

http://front.math.ucdavis.edu/0902.1088