
Hopf25

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Categories graded by group homomorphisms

Given a crossed module χ , Sözer and Virelizier (2023) introduced χ -graded fusion categories for constructing homotopy quantum field theories. However, the full crossed module data are only necessary for the monoidal structure, and it is possible to define categories graded by a group homomorphism τ .

We show that such τ -graded categories form a 2-category 2-equivalent to that of certain ' τ -module' categories. This informs a classification of semisimple τ -graded categories. If time permits, we will also discuss the monoidal structures for these 2-categories.