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Recent Results in Partially Traced Tensor Categories

An abstract theory of traces in monoidal categories was introduced by Joyal, Street, and Verity in 1996 (Proc. Camb. Phil. Soc. **119**, 447–468). Their notion covered a wide range of examples from algebra, knot theory, and algebraic topology to fixed point operators and models of feedback in theoretical computer science and logic. Since then, several groups of authors have investigated partially traced monoidal categories, in which the trace operator is only partially defined. These arise in many settings, from tensored ∗-categories to categorical logic and theoretical computer science. Recently, Esfan Haghverdi and I developed a new notion of partially traced tensor category arising from the proof theory of linear logic (Girard's Geometry of Interaction program), but which seems to have independent mathematical interest. I shall give a survey of many examples of these partial traces, including some recent work by Octavio Malherbe giving new classes of examples arising from monoidal subcategories of traced categories. If time permits, we will mention various recent connections of this work with Freyd's theory of paracategories.