THE STRUCTURE OF THE CATEGORY OF STRICT n-CATEGORIES

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Abstract. The category n-$\mathcal{C}at$ of strict n-categories and strict n-functors is endowed with a rich structure that is only partially understood. First, it is endowed with a tensor product, generalizing Gray's tensor product of 2-categories, first defined by Al-Alg and Steiner in the early 90's. This implies that n-$\mathcal{C}at$, endowed with lax transformations and higher lax transformations, form an n-Gray-category in some appropriate sense. Second, it is endowed with a join construction, generalizing the join construction of categories and compatible with the one of simplicial sets, defined recently by myself and Georges Maltsiniotis. This join is related by adjunctions to slices. The interaction between the tensor product and the join is described by conjectures. These conjectures are still open but a small part of them that we managed to prove easily implies a Quillen's Theorem A for strict n-categories, which was the original motivation for the introduction of the join.

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