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Symmetric monoidal (∞, n)-categories

Symmetric monoidal (∞, n)-categories have been considered in a variety of forms and from several perspectives, including Lurie's commutative algebra objects and, for $(\infty, 1)$-categories, coCartesian fibrations over finite pointed sets satisfying a Segal condition; Gepner and Haugseng's iterated enrichment; and the special Γ-objects of Schommer-Pries, Calaque–Scheimbauer, and Johnson-Freyd.

In this talk, I will introduce a definition in terms of left double (∞, n)-fibrations, building on the framework for double higher categories developed by Moser, Rasekh, and Rovelli. Working internally in a suitable model category presenting (∞, n)-categories, we express the symmetric monoidal Segal condition through spans associated with the inert maps of finite pointed sets. I will then focus on the quasi-categorical case, where we prove a Quillen equivalence with Lurie's presentation via coCartesian fibrations; in the strict one-dimensional case, our approach recovers the ordinary symmetric monoidal categories. Our comparison uses strings of coCartesian morphisms and a staircase construction to pass between the two descriptions. I will explain the ideas behind these constructions and how they relate the two Segal conditions for symmetric monoidality.