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Title: Twisted tensor product of dg categories and a contractible 2-operad.

Abstract: We define a twisted tensor product of two small dg categories defined over a field, and discuss the adjunction it fulfils. We prove that, provided two dg categories C and D are cofibrant, their twisted tensor product is quasi-equivalent to the ordinary tensor product. After that, we construct, by means of the twisted tensor product, a 2-operad acting on the category $\text{Cat}_{\text{dg}}(k)$ of small dg categories. The above mentioned property implies that this 2-operad is contractible. By a general results of Batanin, it makes the category $\text{Cat}_{\text{dg}}(k)$ a weak 2-category.