LAX GRAY TENSOR PRODUCT FOR 2-QUASI-CATEGORIES

YUKI MAEHARA

The Gray tensor product [2, §4] plays a crucial role in classical 2-category theory. It is a “weaker” or “less commutative” kind of product, and there are two versions (up to duality) depending on whether one wants the comparison 2-cell between \((f \otimes 1)(1 \otimes g)\) and \((1 \otimes g)(f \otimes 1)\) to be invertible or not; the former is the pseudo version while the latter is called lax.

Our ultimate goal is to “do 2-category theory” in 2-quasi-categories which are a model of \((\infty, 2)\)-categories introduced by Ara in [1]. In particular, it requires extending the definition of Gray tensor product to the 2-quasi-categorical context. Luckily, their geometric nature means the usual categorical product of 2-quasi-categories models the pseudo Gray tensor product. However, constructing the lax Gray tensor product and proving it is “homotopically well-behaved” (i.e. left Quillen) is a non-trivial task, and this is what we will present in this talk.

References
