BRAIDED AND SYMMETRIC INTERNAL GROUPOIDS

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Via a 2-dimensional version of the classical Eckmann - Hilton argument, braided (strict) categorical groups can be described as the categorical groups where the tensor product has the additional structure of a monoidal functor.

With the help of the internal notion of butterfly developed in [1], as a tool for describing weak morphisms of internal crossed modules, we are able to define a notion of braided internal crossed-module, in a semi-abelian category where the condition "Huq is Smith" holds. Moreover it is possible to define symmetric internal crossed modules by means of an additional property of the braiding.

Under the equivalence between internal groupoids and internal crossed modules, this in turns gives an internal notion of braided (symmetric) groupoids.

References

[1] O. Abbad, S. Mantovani, G. Metere and E.M. Vitale, Butterflies in a semi-abelian context, *preprint* (2011).