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*Proofnets and the Complexity of Proof Equivalence*

Also known as the word problem in category theory, the equivalence problem of a logic asks whether two proofs are related by a set of rule permutation that reflect the commutative conversions of the logic. On the other hand, proofnets for a logic can be broadly defined as combinatorial objects offering canonical representatives for equivalence classes of proofs, enjoying good computational properties.

A notion of proofnet for a logic therefore induces a way to solve the equivalence problem of this logic. This has been used recently to show that the multiplicative fragment (with units) of linear logic cannot have a low-complexity notion of proofnets, by proving that the equivalence problem for this fragment is PSpace-complete.

We will look into the situation for another small fragment of linear logic: the multiplicative-additive (without units) fragment, which intuitionistic part can be seen as a very basic linear  $\lambda$ -calculus with co-products.