

Towards a categorical Künneth formula for motives

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In various geometric situations, one can describe the category of sheaves on $X \times Y$ (a product of varieties over a field k) in terms of sheaves on X and sheaves on Y . Results of this form are referred to as categorical Künneth formulas. Eying applications in the function field Langlands program, we have established, in joint work with Hemo and Richarz (<https://arxiv.org/abs/2012.02853>) such a categorical Künneth formula for étale Weil sheaves. More recently (<https://arxiv.org/abs/2503.14416>), Richarz and I have proposed a conjecture concerning a categorical Künneth formula for motivic sheaves. In this talk I will present this circle of ideas, give evidence for the conjecture and report on recent results using the interplay between motives and non-commutative motives in order to further extend our knowledge regarding this conjecture.

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