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Jarosław Buczyński* (jabu@mimuw.edu.pl), Institute of Mathematics, Polish Academy of Sciences, Śniadeckich 8, 02-632 Warsaw, Poland. *On Strassen's rank additivity for small three-way tensors.*

We will describe the problem of the additivity of the tensor rank. That is, for two independent tensors we study if the rank of their direct sum is equal to the sum of their individual ranks. A positive answer to this problem was previously known as Strassen's conjecture until recent counterexamples were proposed by Shitov. The latter are not very explicit, and they are only known to exist asymptotically for very large tensor spaces. In this talk I will report on a proof that for some small three-way tensors the additivity holds. For instance, if the rank of one of the tensors is at most 6, then the additivity holds. Or, if one of the tensors lives in $\mathbb{C}^k \otimes \mathbb{C}^3 \otimes \mathbb{C}^3$ for any k , then the additivity also holds. More generally, if one of the tensors is concise and its rank is at most 2 more than the dimension of one of the linear spaces, then additivity holds.

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