

Mathematical Colloquia

Monday, 26 September 2022

17:15 h, lecture room B6 (ExWi)

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Is it possible to multiply two pairs of 2x2 matrices faster?

Abstract: We address 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 counterexamples were proposed by Shitov in 2019. The latter are not very explicit, and they are only known to exist asymptotically for very large tensor spaces. I give few condition for the additivity of three-way tensors. As a consequence we obtain that the special case of the conjecture is true. The pair of 2x2 matrix multiplication tensors have the additivity property. Thus, there is no faster way to multiply two pairs of 2x2 matrices, than to multiply the first pair and then the second one independently.