

A nonabelian Brunn-Minkowski inequality

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Abstract

The celebrated Brunn-Minkowski inequality states that for compact subsets X and Y of \mathbb{R}^d , $m(X + Y)^{1/d} \geq m(X)^{1/d} + m(Y)^{1/d}$ where $m(\cdot)$ is the Lebesgue measure. We will introduce a conjecture generalizing this inequality to every locally compact group where the exponent is believed to be sharp. In a joint work with Yifan Jing and Chieu-Minh Tran, we prove this conjecture for a large class of groups (including e.g. all real linear algebraic groups). We also prove that the general conjecture will follow from the simple Lie group case. For those groups where we do not know the conjecture yet (one typical example being the universal covering of $SL_2(\mathbb{R})$), we also obtain partial results. In this talk I will discuss this inequality and explain important ingredients, old and new, in our proof.