

中国科学院数学与系统科学研究院

量子论与信息论

学术报告

报告题目: **Bell Inequalities and Hierarchy of Multipartite Nonlocality**

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摘 要: We propose a hierarchy of Bell-type inequalities for arbitrary n -partite systems that identifies the different degrees of nonlocality ranging from standard to genuine multipartite nonlocality [Phys. Rev. A 94, 022110 (2016)]. We show that the observed joint probabilities in any nonsignaling m -local realistic models should satisfy the $(m - 1)$ -th Bell-type inequality. When $m = 2$, the corresponding inequality reduces to the one shown earlier [Phys. Rev. Lett. 112, 140404 (2014)] whose violation indicates genuine multipartite nonlocality, and when $m = n$, the corresponding inequality is just Hardy's inequality whose violation indicates standard multipartite nonlocality [Phys. Rev. Lett. 109, 120402 (2012)]. Furthermore, we find genuine multipartite nonlocality in the one-dimensional ferromagnetic spin-1/2 chain [Phys. Rev. A 96, 012336 (2017)], and present experimental tests of genuine multipartite nonlocality in the no-signalling scenario [Optics Express 24, 27059 (2016); Sci. Rep. 6, 39327 (2016)].