

Ben Li

Title: Exact values of quantum violations in low-dimensional Bell correlation inequalities

Abstract: The famous Clauser-Horne-Shimony-Holt (CHSH) inequality certifies a quantum violation, by a factor $\sqrt{2}$, of correlations predicted by the classical view of the world in the simplest possible nontrivial measurement setup (two systems with two dichotomic measurements each). In such setting, this is the largest possible violation, which is known as the Tsirelson bound. In this talk we calculate the exact values of quantum violations for the other Bell correlation inequalities that appear in the setups involving up to four measurements; they are all smaller than $\sqrt{2}$. While various authors investigated these inequalities via numerical methods, our approach is analytic. We also include tables summarizing facial structure of Bell polytopes in low dimensions.