

# Measurable no-signalling correlations

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June 20, 2025

## Abstract

A non-local game  $G$  is one where two players play cooperatively against a referee, trying to convince the latter of the joint possession of a certain predescribed knowledge, without any in-game communication allowed. The  $n$ -fold repetition of  $G$  can be viewed as a game over the  $n$ -th cartesian product of the question and answer sets. When considering the infinite repetition of  $G$ , compact topological spaces arise naturally as infinite cartesian products of finite sets. In this talk, we consider the infinite repetition of a finite game as a single infinite game and introduce the notion of a measurable no-signalling correlation by replacing finite sets with second countable, compact, Hausdorff spaces and families of POVMs with operator-valued information channels. We define the measurable counterparts of various classes of no-signalling correlations and focus on the quantum spatial and quantum commuting. To that end, we establish two measurable versions of Stinespring's Dilation Theorem. Finally, we define values of measurable non-local games of local, quantum spatial and quantum commuting type, and show how the asymptotic value of a finite game can be achieved as a special case of the inner value of a measurable game. Based on joint work with Ivan Todorov and Lyudmila Turowska.