

Abstract Submitted
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Indistinguishability as non-locality constraint¹ CASSIO S. AMORIM, Dept. of Applied Physics, Nagoya University, SOLID STATE ENGINEERING TEAM — Quantum mechanics has long bewildered many people and questionings about its consistency and completeness have been raised, such as the famous case of the Einstein-Podolsky-Rosen paradox. Nonetheless, quantum theory has established firm grounds for our understanding about microscopic phenomena, and non-locality and entanglement is nowadays considered an important resource for quantum information processing. However, it has been noticed that relativistic causality and non-locality alone, assumed as axioms, are not enough to explain the limit of two-qubit quantum correlations, known as Tsirelson's bound. In this paper, to obtain such explanation, indistinguishability is added as a fundamental principle to these two axioms set, standing as the source of interaction and correlation. Taken together, the three principles — no-signaling, non-locality, and indistinguishability — can reproduce Tsirelson's bound and offer a simple and elegant explanation to non-local quantum correlations.

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