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Correlations in Open Quantum Systems

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Deadline for manuscript submissions:
closed (18 September 2020)

Message from the Guest Editors

Understanding the difference between classical and quantum systems is one of the greatest challenges of modern science. The peculiar quantum traits of an ideal quantum experiment, described by the unitary evolution of a wavefunction, are arguably well understood. On the other hand, quantumness manifests in more elusive ways when interactions with a complex environment are taken into account, and a quantum process has to be mathematically expressed by a density matrix evolving under a general quantum operation. Studying the rich, emerging hierarchy of different kinds of quantum correlations in this scenario promises to shed light on the key features of noisy quantum systems, including their operational meaning for information processing and their thermodynamic properties.

This Special Issue aims to collect papers advancing our knowledge of quantum correlations in open quantum systems, e.g., quantum computers, communication networks, and sensors which are subject to decoherence and dissipation. We welcome contributions exploring both fundamental questions and applications, having the goal to provide the reader with a state-of-the art description of this rapidly evolving field.

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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