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Title:	Role of Bell-CHSH violation and local filtering in quantum key distribution
Authors:	Singh, Jaskaran (/jspui/browse?type=author&value=Singh%2C+Jaskaran) Arvind, Sandeep K. (/jspui/browse?type=author&value=Arvind%2C+Sandeep+K.) Goyal (/jspui/browse?type=author&value=Goyal)
Keywords:	Bell's inequality CHSH Quantum key distribution Local filtering
Issue Date:	2021
Citation:	Physics Letters A, 392.
Abstract:	In this article, we analyse the relationship between the Bell violation and the secure key rate of entanglement assisted quantum key distribution (QKD) protocols. Specifically, we address the question whether Bell violation is necessary or sufficient for secure communication. We construct a class of states which do not show Bell violation, however, which can be used for secure communication after local filtering. Similarly, we identify another class of states which show Bell violation but can not be used for generating secure key even after local filtering. The existence of these two classes of states demonstrates that Bell violation as an initial resource is neither necessary nor sufficient for QKD, while it becomes necessary after filtration. Our work therefore forces a departure from traditional thinking that the degree of Bell violation is a key resource for quantum communication and brings out the role of local filtering.
Description:	Only IISERM authors are available in the record.
URI:	https://doi.org/10.1016/j.physleta.2021.127158 (https://doi.org/10.1016/j.physleta.2021.127158) http://hdl.handle.net/123456789/4623 (http://hdl.handle.net/123456789/4623)
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