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Title:	Persistence of topological phases in non-hermitian quantum walks.
Authors:	K. Goyal, Sandeep (/jspui/browse?type=author&value=K.+Goyal%2C+Sandeep) Dey, Sanjib (/jspui/browse?type=author&value=Dey%2C+Sanjib) Mittal, Vikas (/jspui/browse?type=author&value=Mittal%2C+Vikas)
Keywords:	Quantum information Theoretical physics Quantum mechanics
Issue Date:	2021
Citation:	Scientific Reports, 11(1).
Abstract:	Discrete-time quantum walks are known to exhibit exotic topological states and phases. Physical realization of quantum walks in a lossy environment may destroy these phases. We investigate the behaviour of topological states in quantum walks in the presence of a lossy environment. The environmental effects in the quantum walk dynamics are addressed using the non-Hermitian Hamiltonian approach. We show that the topological phases of the quantum walks are robust against moderate losses. The topological order in one-dimensional split-step quantum walk persists as long as the Hamiltonian respects exact PT-symmetry. Although the topological nature persists in two-dimensional quantum walks as well, the PT-symmetry has no role to play there. Furthermore, we observe topological phase transition in two-dimensional quantum walks that is induced by losses in the system.
Description:	Only IISER Mohali authors are available in the record.
URI:	<a href="https://doi.org/10.1038/s41598-021-89441-8">https://doi.org/10.1038/s41598-021-89441-8</a> ( <a href="https://doi.org/10.1038/s41598-021-89441-8">https://doi.org/10.1038/s41598-021-89441-8</a> ) <a href="http://hdl.handle.net/123456789/5208">http://hdl.handle.net/123456789/5208</a> ( <a href="http://hdl.handle.net/123456789/5208">http://hdl.handle.net/123456789/5208</a> )
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