Title:	THE GENERALIZED OTOC FROM SUPERSYMMETRIC QUANTUM MECHANICS: Study of Random Fluctuation Eigenstate Representation of Correlation Functions.s from Eigenstate Representation of Correlation Functions
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Keywords:	Out-of-equilibrium quantum statistical mechanics OTOC Supersymmetry
Issue Date:	2021
Publisher:	PrePrints
Citation:	Symmetry-Basel, 13(1).
Abstract:	The concept of out-of-time-ordered correlation (OTOC) function is treated as a very strong theoretical probe of quantum randomness, using which one can study both chaotic and non-chaotic phenomena in the context of quantum statistical mechanics. In this paper, we define a general class of OTOC, which can perfectly capture quantum randomness phenomena in a better way. Further we demonstrate an equivalent formalism of computation using a general time independent Hamiltonian having well defined eigenstate representation for integrable supersymmetric quantum systems. We found that one needs to consider two new correlators apart from the usual one to have a complete quantum description. To visualize the impact of the given formalism we consider the two well known models viz. Harmonic Oscillator and one dimensional potential well within the framework of supersymmetry. For the Harmonic Oscillator case we obtain similar periodic time dependence but dissimilar parameter dependences compared to the results obtained from both microcanonical and canonical ensembles in quantum mechanics without supersymmetry. On the other hand, for one dimensional potential well problem we found significantly different time scale and the other parameter dependence compared to the results obtained from non-supersymmetric quantum mechanics. Finally, to establish the consistency of the prescribed formalism in the classical limit, we demonstrate the phase space averaged version of the classical version of OTOCs from a model independent Hamiltonian along with the previously mentioned these well cited models.
Description:	Only IISERM authors are available in the record.
URI:	http://dx.doi.org/10.20944/preprints202012.0153.v1 (http://dx.doi.org/10.20944/preprints202012.0153.v1) http://hdl.handle.net/123456789/4639 (http://hdl.handle.net/123456789/4639)
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