

Joint Event on  
5<sup>th</sup> International Conference on  
**QUANTUM PHYSICS AND NUCLEAR TECHNOLOGY**  
&  
6<sup>th</sup> International Conference on  
**ATOMIC PHYSICS AND NUCLEAR PHYSICS**

November 18-19, 2019 | Rome, Italy



## ***Mahmoud Abdel-Aty***

*Sohag University, Egypt*

### **New perspectives on controlling steady-state entanglement**

**W**e analyze the dynamics of entanglement and quantum discord in a two-qubit system coupled to squeezed reservoirs. We present analytical expressions that can be used to efficiently calculate the evolution of quantum discord and entanglement between the two qubits. Our results show that quantum discord is a more general and robust measure of quantum correlations than entanglement. Furthermore, there is a relationship between the time before sudden death of entanglement and the reservoir squeezing angle. Additionally, the increase of squeezing angle accelerates the decay of quantum discord. These results provide new avenues for controlling quantum correlations and designing quantum states that can be used for various quantum computing applications.

### **Biography**

Abdel-Aty is a Vice-President of African Academy of Sciences and president of National Committee for International Mathematical Union, Director of the Center for International Relations, Sohag University, and Executive President Consultant for Academic Affairs, Zewail City of Science and Technology. He completed his doctorate in quantum optics at Max-Planck Institute of Quantum Optics, Munich, Germany in 1999. He received the D.Sc. (Doctor of Science in Mathematics and Physics), in 2007. His main interests are theories of quantum measurement, nanomechanical modeling, highly non-classical light, practical information security, and optical implementations of quantum information tasks. He has been published more than 240 papers in international refereed journals, 9 book chapters and 2 books. He is an editor for more than 20 International journals. His research has been widely recognized and he has received several local and international awards. He obtained the Amin Lotfy Award in Mathematics in 2003, the Mathematics State Award for Encouragement in 2003, the Shoman Award for Arab Physicists in 2005, the Third World Academy of Sciences Award in Physics in 2005, Fayza Al-Khorafy award in 2006, the State Award for Excellence in Basic Science in 2009 etc. In 2014 he has been elected as a vice-president of the African Academy of Science and in 2016 he has been elected as a member of governor council, GC, of Egyptian Mathematical Society and managing editor of its journal. In 2018 he has been awarded as Mohammed Bin Rashed Prize for Arabic Language, in category "Best Initiative for Arabic Language Policy and Strategy".

mabdelaty@zewailcity.edu.eg