

CURRICULUM VITAE

PERSONAL DATA

Name	Kamal Berrada
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EDUCATION

Year	Academic Degree	Institution
2011	PhD in Theoretical Physics	Department of Physics, College of Sciences, Mohammed –V University, Rabat, Morocco
2007	MSc in Condensed Matter Physics	Department of Physics, College of Sciences, Chouaib Doukkali University, El Jadida, Morocco
2005	BSc in Physics	Department of Physics, College of Sciences, Chouaib Doukkali University, El Jadida, Morocco

WORK EXPERIENCE

Period	Position	Address
2021-present	Professor	Department of Physics, College of Science, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia
2016-2020	Associate Professor	Department of Physics, College of Science, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia
2012-2015	Assistant Professor	Department of Physics, College of Science, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia
2011-2016	Researcher	International Centre for Theoretical Physics (ICTP), Trieste, Italy.
2010-2011	Researcher	Institut für Angewandte Physik, Technische Universität Darmstadt, Germany.
2008-2010	Teaching Assistant	College of Sciences, Mohamed-V University, Rabat, Morocco.

RESEARCH INTERESTS

Quantum optics and information: Classical and Quantum Correlations -Open quantum system under Markovian and non-Markovian dynamics -Measure of non-Markovianity - Quantum solar energy-Quantum batteries-Quantum speed up-Quantum and Classical Fisher-Quantum Metrology-Geometric Phase-Parameter Estimation-Coherence, Squeezing-Quantum Tomography, Quantum Teleportation-Quantum Cryptography-Super Dense Coding- Quantum Fixed Point-Superconductivity qubit systems, Quantum Dot-Atom-field systems-Ideal and real Lasers-Quantum Network-Solid state systems.

PUBLICATIONS

144- M. S. Al-Ghamdi, S. Abdel-Khalek, K. Berrada and S. D. Al-Sahafi, Emission spectrum for a cascade-type three-level atom driven by optical field in photon added coherent state of PHO, To appear in Laser Physics Letters (2023).

143- K. Berrada, S. Abdel-Khalek and M. Algarni, Coherence, purity and correlation for superconducting charge qubits, Results in Physics 48, 106414 (2023).

142- K. Berrada, M. Algarni, M. Marin and S. Abdel-Khalek, Effects of Dipole-Dipole Interaction and Time-Dependent Coupling on the Evolution of Entanglement and Quantum Coherence for Superconducting Qubits in a Nonlinear Field System, Symmetry 15, 732 (2023).

141- M. Algarni, K. Berrada and S. Abdel-Khalek, Parameter Estimation and Squeezing of Superconducting Qubits in the Presence of Intrinsic Decoherence, Journal of Russian Laser Research, 1-11 (2023).

140- B. M. Raffah, K. Berrada, S. Abdel-Khalek and Y. Al-Hadeethi, Entanglement and Fisher information for two superconducting qubits interacting with a deformed field, Optical and Quantum Electronics 55, 150 (2023).

139- M. Algarni, K. Berrada, S. Abdel-Khalek and H. Eleuch, System of six-level atom interacting with a quantized field in the existence of time-varying coupling, Results in Physics, 106233 (2023).

138- K. Berrada, S. Abdel-Khalek, A. Alkaoud and H. Eleuch, Entanglement and coherence in a system of two atoms in the presence of Kerr medium, Results in Physics 44, 106172 (2023).

137- K. Berrada, S. Abdel-Khalek, M. Algarni and H. Eleuch, Entanglement and Fisher Information for Atoms-Field System in the Presence of Negative Binomial States, Entropy 24 (12), 1817 (2022).

136- M. Algarni, K. Berrada, S. Abdel-Khalek and H. Eleuch, Three-level atom-field in the context of time-dependent coupling and power-lower potentials, Results in Physics 43, 106089 (2022).

135- K. Berrada, S. Abdel-Khalek, E. M. Khalil, A. Alkaoud and H. Eleuch, Entanglement and Fisher information for a two-atom system interacting with deformed fields in correlated two-mode states, Chaos, Solitons & Fractals 164, 112621 (2022).

134- M. Algarni, K. Berrada, S. Abdel-Khalek and H. Eleuch, Parity Deformed Tavis-Cummings Model: Entanglement, Parameter Estimation and Statistical Properties, Mathematics 10, 3051 (2022).

133- M. Algarni, K. Berrada and S. Abdel-Khalek, Quantum coherence and parameter estimation for mixed entangled coherent states, Modern Physics Letters A 37, 2250159 (2022).

132- A. S. Altowyan, K. Berrada, S. Abdel-Khalek and H. Eleuch, Quantum coherence and total phase in

- semiconductor microcavities for multi-photon excitation, *Nanomaterials* 12, 2671 (2022).
- 131- Z. M. H. El-Qahtani, K. Berrada, S. Abdel-Khalek and H. Eleuch, Thermal Fisher information and entropy squeezing for superconducting qubits, *Results in Physics* 39, 105639 (2022).
- 130- M. Algarni, K. Berrada and S. Abdel-Khalek, Quantum Coherence in Non-Markovian Quantum Channels, *Journal of Russian Laser Research* 43, 397 (2022).
- 129- M. S. Al-Ghamdi, K. Berrada, S. Abdel-Khalek and H. Eleuch, Effect of relativistic motion on superconducting quantum bits under decoherence, *Results in Physics* 38, 105402 (2022).
- 128- Z. M. H. El-Qahtani, S. Abdel-Khalek and K. Berrada, Quantum coherence and degree of mixedness for a system of two superconducting qubits under decoherence conditions, *Journal of Russian Laser Research* 43, 139 (2022).
- 127- K. Berrada and H. Eleuch, Einstein-Podolsky-Rosen steering and nonlocality in quantum dot systems, *Physica E: Low-dimensional Systems and Nanostructures* 126, 114412 (2021).
- 126- O. Aldaghri and K. Berrada, Entanglement Generation and Nonclassical Properties of Nonlinear Coherent States Created By Repeating the Photon Addition and Subtraction, *Journal of Russian Laser Research* 42, 273 (2021).
- 125- S. Abdel-Khalek, K. Berrada, E. M. Khalil, A. S. F. Obada, E. Reda and H. Eleuch, Quantumness measures for a system of two qubits interacting with a field in the presence of the time-dependent interaction and Kerr medium, *Entropy* 23, 635 (2021).
- 124- I. A. Osman, K. K. Kabashi, S. Abdel-Khalek, K. Berrada and A. S. Altowyan, Properties of transient spectrum and field purity for a qubit system in squeezed states, *Results in Physics* 26, 104297 (2021).
- 123- K. Berrada, B. Raffah, and H. Eleuch, Long-time protection of correlations and coherence in squeezed thermal bath Chaos, *Solitons & Fractals* 143, 110501 (2021).
- 122- M. Algarni, K. Berrada, S. Abdel-Khalek and H. Eleuch, Quantum Coherence of Atoms with Dipole–Dipole Interaction and Collective Damping in the Presence of an Optical Field, *Symmetry* 13, 2327 (2021).
- 121- S. Abdel-Khalek, K. Berrada, Z.M.H. El-Qahtani and M.S. Al-Ghamdi, Quantum correlation and statistical properties in semiconductor microcavities with time-varying coupling effect, *Materials Science and Engineering: B* 264, 114936 (2021).
- 120- S. Abdel-Khalek, K. Berrada, E. M. Khalil, H. Eleuch, A. S. F. Obada and E. Reda, Tavis–Cummings Model with Moving Atoms, *Entropy* 23, 452 (2021).
- 119- S. Abdel-Khalek, K. Berrada, and A. Alkaoud, Nonlocality and coherence in double quantum dot systems, *Physica E: Low-dimensional Systems and Nanostructures*, 114679 (2021).
- 118- S. Abdel-Khalek, K. Berrada, M. Algarni and H. Eleuch, Einstein-Podolsky-Rosen Steering for Mixed Entangled Coherent States, *Entropy* 23, 1442 (2021).
- 117- S. Abdel-Khalek, K. Berrada, E.M. Khalil, F. Almalki, Entanglement of General Two-Qubit States in a Realistic Framework, *Symmetry* 13, 386 (2021).
- 116- E.M. Khalil, K. Berrada, S. Abdel-Khalek, B. Alsubei, and H. Eleuch, Dephasing Process of a Single Atom Interacting with a Two-Mode Field, *Entropy* 23, 252 (2021).
- 115- S. Abdel-Khalek, K. Berrada and S.A. Aldaghfag, Quantum correlations and non-classical properties for two superconducting qubits interacting with a quantized field in the context of deformed

- Heisenberg algebra, *Chaos, Solitons & Fractals* 143, 110466 (2021).
- 114- M. Algarni, K. Berrada, S. Abdel-Khalek and H. Eleuch, Coherence Trapping in Open Two-Qubit Dynamics, *Symmetry* 13, 2445 (2021).
- 113- S. Abdel-Khalek, K. Berrada and A.S. Altowyan, Quantum Features of Atom–Field Systems in the Framework of Deformed Fields, *Applied Sciences* 11, 408 (2021).
- 112- S.A. Aldaghfag, K. Berrada, and S. Abdel-Khalek, Entanglement and photon statistics of two dipole–dipole coupled superconducting qubits with Kerr-like nonlinearities, *Results in Physics* 16, 102978 (2020).
- 111- E.M. Khalil, K. Berrada, S. Abdel-Khalek, A. Al-Barakaty, and J. Peřina, Entanglement and entropy squeezing in the system of two qubits interacting with a two-mode field in the context of power low potentials, *Scientific Reports* 10, 1 (2020).
- 110- S.A. Aldaghfag, Z.M. Elqahtani, K. Berrada, and S. Abdel-Khalek, Interaction of a superconducting qubit and a nonlinear field under energy dissipative effect: entanglement and nonclassical properties, *Optical and Quantum Electronics* 52, 1 (2020).
- 109- B. Raffah, S. Abdel-Khalek, K. Berrada, E. Khalil, Y. Al-Hadeethi, and N. Almalky, Quantum correlations and quantum Fisher information of two qubits in the presence of the time-dependent coupling effect, *The European Physical Journal Plus* 135, 1 (2020).
- 108- A.S. Altowyan, SA Aldaghfag, K. Berrada, and S. Abdel-Khalek, Emission Spectrum and Nonclassical Properties of an Atom–Field System Under an Intensity-Dependent Field, *Journal of Russian Laser Research*, 1-7 (2020).
- 107- B. Raffah, K. Berrada, S. Abdel-khalek, E.M. Khalil, and M.R. Wahiddin, Interaction of a three-level atom and a field with a time-varying frequency in the context of triangular well potentials: An exact treatment, *Chaos, Solitons & Fractals* 139, 109784 (2020).
- 106- B.M. Raffah, E.M. Khalil, S. Abdel-Khalek, K. Berrada, Y. Al-Hadeethi, A.T. Ali, Information quantifiers for trapped ion in a carrier excitation laser field, *Modern Physics Letters A* 35, 2050235 (2020).
- 105- A.S. Altowyan, S.A. Aldaghfag, K. Berrada, and S. Abdel-Khalek, Emission Spectrum and Fidelity of an Atomic System Coupled to Fields with Level Energy Differences, *Journal of Russian Laser Research* 41, 327 (2020).
- 104- K. Berrada, B. Raffah, and H. Eleuch, Quantum correlations and coherence in a driven two-qubit system under non-Markovian dissipative effect, *Results in Physics* 17, 103083 (2020).
- 103- K. Berrada, Entropy squeezing and coherence for a non-Markovian dissipative qubit system, *Modern Physics Letters A* 35, 2050046 (2020).
- 102-K. Berrada, Quantum coherence in quantum dot systems, *Physica E: Low-dimensional Systems and Nanostructures* 116, 113784 (2020).
- 101- Shatha A. Aldaghfag, Zainab M. El-Qahtani, K. Berrada, and S. Abdel-Khalek, Nonclassical and Nonlocal Properties of a Superconducting Qubit in the Presence of a Kerr-Like Medium Under Decoherence Effect, *Journal of Superconductivity and Novel Magnetism* <https://doi.org/10.1007/s10948-019-05419-8> (2020).
- 100- Aber. S Altowyan, S. Abdel-Khalek, and K. Berrada, Emission Spectrum and geometric phase in

deformed Jaynes-Cummings model, Results in Physics, 102924 (2020).

99- K. Berrada, Entropy squeezing and coherence for a non-Markovian dissipative qubit system, Modern Physics Letters A, 2050046 (2019).

98- S. Abdel-Khalek, K. Berrada, and H. Eleuch, Quantum Correlation and Nonclassical Properties in Semiconductor Microcavities for Multi-Photon Excitation, International Journal of Quantum Information 17, 1950047 (2019).

97- Aber. S Altowyan, K. Berrada, and S. Abdel-Khalek, Emission spectrum and nonclassical properties of the atom-field system under field intensity dependent, Journal of Russian Laser Research (2019).

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96- K. Berrada and H. Eleuch, Noncommutative deformed cat states under decoherence, Physical Review D 100, 016020 (2019).

95- S. Abdel-Khalek and K. Berrada, Entanglement, nonclassical properties, and geometric phase in circuit quantum electrodynamics with relativistic motion, Solid State Communications 290, 31 (2019).

94- K. Berrada, Quantum dynamics of measurements in terms of inter-qubit distances with a collective damping, Solid State Communications 303, 113726 (2019).

93- A. M. Almarashi, A. Algarni, F. M. Alaboud, S. Abdel-Khalek, and K. Berrada, Optical tomography for excited coherent states associated to deformed oscillators,

Results in Physics 14, 102352 (2019).

92- K. Berrada and A. Alkaoud, Energy transfer, correlations and decoherence in a dimer in terms of the two-level atomic distances, Quantum Information Processing 18 (6), 184 (2019).

91- B. M. Raffah and K. Berrada, Nonclassical and nonlocal properties of atom-field systems in the framework of Pöschl-Teller potentials, Results in Physics 13, 102134 (2019).

90- K. Berrada and H Eleuch, Coherence and squeezing of a two-level system with a phase jump, Laser Physics 29, 075203 (2019).

89- K. Berrada and O Aldaghri, Coherence and entropy squeezing in the spin-boson model under non-Markovian environment, Optical and Quantum Electronics 51, 61 (2019).

88- K. Berrada, Quantum speedup in structured environments, Physica E. 95, 6 (2018).

87- S. Abdel-Khalek, K. Berrada, and H. Eleuch, Quantum quantifiers of Raman photon pairs with relativistic motion, Opt. Quant. Electron. 50, 151 (2018).

86- K. Berrada and H. Eleuch, Quantum correlations in non-Markovian open quantum systems at different ranges of temperature, Laser Phys. 28, 085201 (2018).

85- K. Berrada and H. Eleuch, Measure of non-Gaussianity for photon-added nonlinear coherent states, International Journal of Geometric Methods in Modern Physics. 15, 1850158 (2018).

84- K. Berrada, Geometric phase for a two-level system in photonic band gap crystal, Solid State Communications. 273, 34 (2018).

83- B. Mohammadnoor Raffah and K. Berrada, Quantum Quantifiers for an Atom System Interacting with a Quantum Field Based on Pseudoharmonic Oscillator States, Entropy. 20, 607 (2018).

82- Reda M. El-Shishtawy, Robert C. Haddon, Saleh H. Al-Heniti, Bahaaudin M. Raffah, K. Berrada, S. Abdel-Khalek, and Yas F. Al-Hadeethi, Quantum transfer energy in the framework of time-dependent

dipole-dipole interaction, *Results in Physics*. 8, 89 (2018).

81- K. Berrada, Quantum and classical correlations for interacting and non-interacting qubits in contact with different environments, *J. Russian Laser Research*. 39, 1 (2018).

80- K. Berrada, Quantum metrology with classical light states in non-Markovian lossy channels, *JOSA B* 34, 1912 (2017).

79- K. Berrada and M. A. Al-Rajhi, Information quantifiers, entropy squeezing and entanglement properties of superconducting qubit-deformed bosonic field system under dephasing effect *Quantum Information Processing* 16, 239 (2017).

78- K. Berrada and O. Aldaghri, Quantum measurements in spin-boson model under non-Markovian environment, *Physica E: Low-dimensional Systems and Nanostructures* 91, 173 (2017).

77- K. Berrada and S. Abdel-Khalek, Quantum Phase and Nonlocal Correlations for a Three-Level System Interacting with Laser Light in a Nonlinear Kerr Medium Under Decoherence, *Journal of Russian Laser Research* 38, 124 (2017).

76- K. Berrada and H. Eleuch, Quantum preservation of the measurements precision using ultra-short strong pulses in exact analytical solution, *Laser Physics Letters* 14, 095203 (2017).

75- K. Berrada, Enhancing the precision of measurements in double quantum dot systems via transmission line resonator, *Chaos, Solitons & Fractals* 99, 2 (2017).

74- R. M. El-Shishtawy, K. Berrada, R.C. Haddon, Y. F. Al-Hadeethi, and S. H. Al-Heniti, Quantum Transfer Energy and Nonlocal Correlation in a Dimer with Time-Dependent Coupling Effect, *International Journal of Theoretical Physics* 56, 1417 (2017).

73- K. Berrada, S. Abdel-Khalek, and A. Eid, Sudden Death, Sudden Birth, and Nonclassical Effects of Photon-Added Power-Law Potential Within the Framework of Subsystem-Environment Correlations, *Journal of Russian Laser Research* 37, 45 (2016).

72- L. K. Castelano, F. F. Fanchini, and K. Berrada, Open quantum system description of singlet-triplet qubits in quantum dots, *Physical Review B* 94, 235433 (2016).

71- S. Abdel-Khalek, K. Berrada, S. Alkhateeb, Quantum correlations between each two-level system in a pair of atoms and general coherent fields, *Results in physics* 6, 780 (2016).

70- K. Berrada and S. Abdel-Khalek, Nonclassical properties and purity of a qubit system in photon-added squeezed thermal states with time-dependent coupling effect

Physica E: Low-dimensional Systems and Nanostructures 84, 361 (2016).

69- R. El-Shishtawy, R. Haddon, S. Al-Heniti, B. Raffah, and S. Abdel-Khalek, K. Berrada, and Yas Al-Hadeethi, Realistic Quantum Control of Energy Transfer in Photosynthetic Processes *Energies* 9, 1063 (2016).

68- K. Berrada, Detecting Quantum Dissonance and Discord in Exact Dynamics of qubit Systems *International Journal of Theoretical Physics* 55, 3479 (2016).

67- S. Abdel-Khalek, K. Berrada, and S. A. Alkhateeb, Measures of nonclassicality for a two-level atom interacting with power-law potential field under decoherence effect,

Laser Physics 26, 095201 (2016).

66- K. Berrada, Phase sensitivity in deformed-state superposition considering nonlinear phase shifts

Laser Physics 26, 075201 (2016).

65- S. Abdel-Khalek, M. A. Al-Rajhi, and K. Berrada, Entanglement and Statistical Properties of a System Consisting of Three-Level Atom Interacting with a Nonlinear Kerr Medium Field Acta Physica Polonica A 129 (6), 1083 (2016).

64- S. Alkhateeb, S. Abdel-Khalek, K. Berrada, E. M. A. Hilal, Entanglement, nonclassical properties and geometric phase of Raman photon pairs in the presence of time-dependent coupling Results in physics 6, 407 (2016).

63- K. Berrada, Theoretical approach to characterize the non-Markovianity and diffusion through the influx of the information, Quantum Information Processing 15, 4897 (2016).

62- S. Abdel-Khalek, K. Berrada, and H. Eleuch, Erratum to "Effect of the time-dependent coupling on a superconducting qubit-field system under decoherence: Entanglement and Wehrl entropy"[Ann. Physics 361 (2015) 247–258], Annals of Physics 372, 564 (2016).

61- K. Berrada, Trapping phenomenon of the parameter estimation in asymptotic quantum states, Laser Physics 26 (9), 095203 (2016).

60- K. Berrada and S. Abdel-Khalek, Entanglement for a Two-Level Atomic System Interacting with Two-Mode Spin States, Journal of Russian Laser Research 37, 337 (2016).

59- K. Berrada, Parameter estimation with and without using rotating-wave approximation Optical and Quantum Electronics 48, 180 (2016).

58-K. Berrada, Protecting the precision of estimation in a photonic crystal, J. Opt. Soc. Am. B. 4, 591 (2015).

57-K. Berrada, Control of quantum correlations in solid state systems, Solid State Communications. 221, 18 (2015).

56- K. Berrada, C. H. Raymond Ooi, and S. Abdel-Khalek, Geometric phase and entanglement of Raman photon pairs in the presence of photonic band gap, Journal of Applied Physics. 117, 124904 (2015).

55- K Berrada and H Eleuch, Consideration of geometric phase and population transfer without using rotating-wave approximation, Laser Phys. 25, 025201 (2015).

54-K. Berrada, Construction of photon-added spin coherent states and their statistical properties, Journal of Mathematical Physics. 56, 072104 (2015).

53-S. Abdel-Khalek, K. Berrada, and H. Eleuch, Effect of the time-dependent coupling on a superconducting qubit-field system under decoherence: Entanglement and Wehrl entropy, Annals of Physics. 361, 247 (2015).

52- S. Abdel-Khalek, K. Berrada, A.-S. F. Obada, and M. R. B. Wahiddin, Entropy squeezing for qubit-field system in the presence multi-photon process under decoherence effect, Opt. Quant. Electron. 47, 267 (2015).

51- K. Berrada, Bipartite entanglement within the framework of power-law potential systems, Journal of Russian Laser Research. 36, 35 (2015).

50- K. Berrada and H. Eleuch, Quantum control of the geometric phase in exact analytical solution using ultra-short strong pulses, Laser Phys. 25, 105201 (2015).

49- S. Abdel-Khalek, K. Berrada, and M. R. B. Wahiddin, Entanglement for Moving Three-Level Atom

Under Decoherence Effect, Journal of

Computational and Theoretical Nanoscience. 12, 1 (2015).

48-K. Berrada, High precision regions of phase sensitivity for the superposition of coherent fields, Laser Physics Letters. 11, 105202 (2014).

47-S. Abdel-Khalek, K. Berrada, H. Eleuch, and M. Abdel-Aty, Engineering Geometric Phase in Semiconductor Microcavities, Physica E: Low-dimensional Systems and Nanostructures. 64, 112 (2014).

46-K. Berrada, Improving quantum phase estimation via power-law potential systems, Laser Physics. 24, 065201 (2014).

45-S. Abdel-Khalek, K. Berrada, A. S. F. Obada, and M. R. B. Wahiddin, Entropy squeezing for qubit-field system in the presence multi-photon process under decoherence effect, Optical and Quantum Electronics, DOI 10.1007/s11082-014-9911-5,1-12 (2014).

44-A. Chafik, K. Berrada, H. Eleuch, and M. Abdel-Aty, M-Flip Concurrence in the Framework of Multipartite Spin Coherent States, Journal of Computational and Theoretical Nanoscience 11, 2091 (2014).

43-S. Abdel-Khalek, K. Berrada, ASF Obada, and MR Wahiddin, Entropy squeezing for qubit-field system under decoherence effect, Quantum Electronics. 44, 274 (2014).

42-K. Berrada, Geometric phase of a qubit driven by a phase noise laser under non-Markovian dynamics. Annals of Physics. 340, 60 (2014).

41-K. Berrada, Thermal quantum fisher information in quantum dot system, Solid State Communications. 184, 1 (2014).

40-K. Berrada, Maximal entanglement from photon-added nonlinear coherent states via unitary beam splitters, Chinese Physics B. 23, 024208 (2014).

39-K. Berrada, Quantum metrology with SU (1, 1) coherent states in the presence of nonlinear phase shifts, Phys. Rev. A 88, 013817 (2013).

38-K. Berrada, Investigation of quantum and classical correlations in a quantum dot system under decoherence, Laser Physics. 23, 095201 (2013).

37-K. Berrada, Non-Markovian effect on the precision of parameter estimation, Phys. Rev. A 88, 035806 (2013).

36-A. S. F. Obada, A. Abdel-Khalek, K. Berrada, and M. E. Shaheen, Investigations of information quantifiers for the Tavis–Cummings model, Physica A. 392, 6624 (2013).

35-K. Berrada and M. A. Al-Rajhi, Journal of Russian Laser Research. 34, 409 (2013).

34-K. Berrada and S. Abdel-Khalek, Quantum Phase estimation for nonlinear phase shifts with entangled spin coherent states of two modes, Laser Physics. 23, 105201 (2013).

33-F. Khashami, Y. Maleki, and K. Berrada, Entanglement Degree of Finite-Dimensional Pair Coherent States, Journal of Russian Laser Research. 34, 388 (2013).

32-S. Abdel-Khalek, K. Berrada, Mohamed A. El-Sayed and M. Abdel-Aty, Chinese Physics B. 22, 100301 (2013).

- 31- K. Berrada, S. Abdel-Khalek, and C. H. Raymond Ooi, Geometric Phase and entanglement for a single , Quantum. Inf. Process. 12, 2177 (2013).
- 30-K. Berrada, S. Abdel-Khalek, H. Eleuch, and Y. Hassouni, Beam Splitting and Entanglement Generation: Excited Coherent States, Quantum. Inf. Process. 12, 69 (2013).
- 29-K. Berrada, Detecting quantum and classical correlations Using Quantum Dot system, Physica E. 54, 162 (2013).
- 28-K. Berrada, S. Abdel-Khalek, and C. H. Raymond Ooi, Erratum to: Geometric phase and entanglement for a single qubit interacting with deformed-states superposition, Quantum. Inf. Process. 12, 2189 (2013).
- 27- K. Berrada, Quantum and classical quantifiers for nonlinear fields under decoherence, Open Syst. Inf. Dyn. 20, 1350001 (2013).
- 26- K. Berrada, F. F. Felipe, and S. Abdel-Khalek, Quantum correlations between qubit and its environment in terms of interatomic distance, Phys. Rev. A 85, 052315 (2012).
- 25- K. Berrada, M. El Baz, H. Eleuch and Y. Hassouni, Bipartite Entanglement of Nonlinear Quantum Systems in the Context of the q-Heisenberg Weyl Algebra , Quantum. Inf. Process. 11, 352 (2013)
- 24- K. Berrada, S. Abdel-Khalek and C. H. Raymond Ooi, Quantum metrology with entangled spin-coherent states of two modes, Phys. Rev. A 86, 033823 (2012).
- 23- K. Berrada, S. Abdel-Khalek, and A. S. Alaamer, Bipartite Entanglement in the framework of ideal and real lasers, J. Russian Laser Research. 33, 276 (2012).
- 22- Abdel-Khalek, K. Berrada, and C. H. Raymond, Beam Splitter Entangler for Nonlinear Bosonic Fields, Laser Physics. 22, 1449 (2012).
- 21- K. Berrada, A. Mohammadzade, S. Abdel-Khalek, S H. Eleuch, and S. Salimi, Nonlocal correlations for manifold quantum systems: Entanglement of two-spin states, Physica E. 45, 21 (2012).
- 20- K. Berrada, Abdel-Khalek and A.S.F. Obada, Quantum Fisher information for a qubit system placed inside a dissipative cavity, Phys. Lett. A 367, 1412 (2012).
- 19- K. Berrada, Classical and Quantum Correlations for Two-Mode Coherent-State Superposition, Optics Communications. 285, 2227 (2012).
- 18- S. Abdel-Khalek, K. Berrada Y. S. El-Saman, and M. Abdel-Aty, J. Russian Laser Research. 33, 437 (2012).
- 17- S. Salimi, A. Mohammadzade, K. Berrada, Concurrence for a two-qubit Mixed State Consisting of Three Pure States in the Framework of SU(2) Coherent States. Quantum. Inf. Process. 11, 501 (2013).
- 16-S. Abdel-Khalek, K. Berrada and A.S.F. Obada, Quantum Fisher information for a single qubit system, European Physical Journal D. 66, 1 (2012).
- 15- K. Berrada and S. Abdel-Khalek, Entanglement of Atom-Field interaction For Nonlinear Optical Fields, Physica E. 44, 628 (2011).
- 14- K. Berrada, H. Eleuch and Y. Hassouni, Asymptotic Dynamics of quantum discord in open quantum systems, J. Phys. B: At. Mol. Opt. Phys.44, 145503 (2011).
- 13- S. Abdel-Khaled, K. Berrada, H. Eleuch and M. Aty, Dynamics of Wehrl entropy of a degenerate two-photon process with a nonlinear medium, Optical and Quantum Electronics. 42, 887 (2011).

- 12- K. Berrada, A. Benmoussa and Y. Hassouni, Entanglement generation with deformed Barut-Girardello coherent states as input states in a unitary beam splitter, *Quantum. Inf. Process.* 10, 575 (2011).
- 11- K. Berrada, M. El Baz and Y. Hassouni, Generalized spin coherent states: construction and some physical properties, *J. Stat. Phys.* 142, 510 (2011).
- 10- K. Berrada, Y. Hassouni and H. Eleuch, Degree of entanglement and violation of Bell inequality by two-spin-1/2 states, *Commun. Theor. Phys.* 56, 679-686 (2011).
- 9- K. Berrada, M. El Baz and Y. Hassouni, Generalized Heisenberg algebra coherent states for power-law potentials, *Phys. Lett. A* 375, 298 (2011).
- 8- K. Berrada and Y. Hassouni, Maximal Entanglement of Bipartite Spin States in the Context of Quantum Algebra, *Eur. Phys. J. D.* 61, 513 (2011).
- 7- K. Berrada, H. El Baz and Y. Hassouni, On the construction of generalized $SU(1,1)$ coherent states, *Rep. Math. Phys.* 68, 23 (2011).
- 6- K. Berrada and Y. Hassouni, Entanglement measure of bipartite system states, *Int. J. Geom. Meth. Mod. Phys.* 7, 1 (2010).
- 5- K. Berrada, H. Eleuch and Y. Hassouni, Entanglement of more general Two-qubit states, *Physics Express.* 1, 175 (2010).
- 4- K. Berrada, A. Chafik, H. Eleuch and Y. Hassouni, Concurrence in the framework of coherent states, *Quant .Inf. Process.* 9, 13-26 (2010).
- 3- K. Berrada, M. El Baz, H. Eleuch and Y. Hassouni, A comparative study of negativity and concurrence based on spin coherent states, *Int. J. Mod. Phys. C.* 21, 291-305 (2010).
- 2- K. Berrada, M. El Baz, F. Saif and Y. Hassouni, Entanglement generation from deformed spin coherent states using a beam splitter, *J. Phys. A: Math. Theor.* 42, 285306 (2009).
- 1- K. Berrada, A. Chafik, H. Eleuch and Y. Hassouni, Entanglement of two-qubit nonorthogonal states, *Int. J. Mod. Phys. B.* 23, 2021 (2009).