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New applications for optical systems

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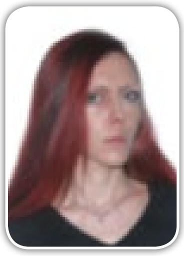

Abstract

Quantum optical systems are analyzed for their natural features of semiclassical states. The quantum description of the systems, and the classical resulting limit for the analysis of particular features of macroscopic objects have not been investigating yet, according to the possibility offered for the description both of quantum fields and for the analysis of the measurements of Astrophysical interest performed by optical instruments. The theoretical imterpretation of the proposed experiments can be achieved by ne further expansions of the Optical Euivalence Principle (in the momentum representation for the considered highly-energetic fields, such as laser fileds). The discovery of new particles, the verification of the existence of particles postulated in modern Theories, as well as properties of particles not still verified within the experimental errors can be investigated by means of the existing experimental apparati, for which the limit of the interpretation of the systems as quantum-optical systems can find a suitable description after the semiclassical limit. Cantilever experiments constitute a structured example of semiclassical quantum optical systems, for which, under the hypothesis of highly-energetic fields, new features of the molecular dynamics and interaction are obtained within the pertinent application of the Optical Equivalence Principle, and the corresponding separation of the description of possible 'foamy' quantum properties of the spacetime at the possible 'foamy' sclaes. The quantum interaction produced to macroscopic objects offer another example of optical systems, for which also the properties of the spacetimes can be further investigated, as a further result at the semiclassical level. Comparison in the search for new exoplanets can be achieved in the uncertainties attributed to high-intensity laser fields, after the implementation of the proper paradigms, within the framework of combination of (suitably-energetic) optical spectorscopy and interferometry, by upgrading the limits imposed on the experimental uncertainties for the high-intensity of the laser fields, after taking into account the related dissipation phenomena in quantum metrology for the considered calibrations of the laser fields. By means of similar techniques in the analysis of the Fourier transform of themeasurements recovered by the Spectrograph, not only the presence (measure of the mass), but the features which delineate the trajectories of the orbits of such exoplanets can be determined with further accuracy. Further improvements for the description of Galaxies, extra-Galactical objects and inter-galactical matter can be achieved. Further new examples of laser interferometry experimental apparati techniques can be obtained in a wide range of applications, such as cold atomic ensembles and cold atomic trapped ions (at different optical scales), temperature-jump experiment for protein-folding (and) in molecular dynamics, quantum correlation of multispatial modes for Gauss-Markoff models, uncertainties estimations in quantum metrology, in decoherence and dissipation and for mixed system-collections for new highly-intense laser fields after the application for the of the pertinet expansions within the formalism of the Optical equivalence Principle.

Biography

Lecian OM has completed her PhD in 2008 from Sapienza University of Rome, Italy, and ICRA (International Center for Relativistic Astrophysics), Rome, Italy. She is Professor at Sapienza University of Rome. She has over 50 publications that have been cited over 160 times, and her publication H-index is 6 and has been serving as an editorial board member of reputed Conferences Journals.

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