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## Superposition of nonlinear coherent states on a sphere

T Hosseinzadeh, A Mahdifar, and E Amooghorban

Department of Physics, Faculty of Science, Shahrekord University, Shahrekord, Iran

E-mail: mahdifar\_a@sci.sku.ac.ir

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### Abstract

In this paper, by using the nonlinear coherent states on a sphere, we introduce superposition of the aforementioned coherent states. Then, we consider quantum optical properties of these new superposed states and compare these properties with the corresponding properties of the nonlinear coherent states on the sphere. Specifically, we investigate their characteristics function, photon-number distribution, Mandel parameter, quadrature squeezing, anti-bunching effect and Wigner function, and obtain the curvature effect on the properties of the superposed states. Finally, by using the trapped atom system, we introduce a theoretical scheme to generate superposition of the coherent states on the sphere.

**Keywords:** nonlinear coherent states on sphere, superposition of states, generation of coherent state

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