

## Accepted Manuscript

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PII: S0003-4916(17)30286-5

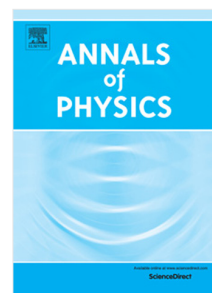
DOI: <https://doi.org/10.1016/j.aop.2017.10.004>

Reference: YAPHY 67501

To appear in: *Annals of Physics*

Received date: 3 February 2017

Accepted date: 2 October 2017



Please cite this article as: D. Bouaziz, T. Birkandan, Singular inverse square potential in coordinate space with a minimal length, *Annals of Physics* (2017), <https://doi.org/10.1016/j.aop.2017.10.004>

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# Singular inverse square potential in coordinate space with a minimal length

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## Abstract

The problem of a particle of mass  $m$  in the field of the inverse-square potential  $\alpha/r^2$  is studied in quantum mechanics with a generalized uncertainty principle, characterized by the existence of a minimal length. Using the coordinate representation, for a specific form of the generalized uncertainty relation, we solve the deformed Schrödinger equation analytically in terms of confluent Heun functions. We explicitly show the regularizing effect of the minimal length on the singularity of the potential. We discuss the problem of bound states in detail and we derive an expression for the energy spectrum in a natural way from the square integrability condition; the results are in complete agreement with the literature.

Keywords: generalized uncertainty principle, minimal length, inverse square potential, singular potentials.

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