

[Quesne, C.](#); [Tkachuk, V. M.](#)

Deformed algebras, position-dependent effective masses and curved spaces: an exactly solvable Coulomb problem. (English) [Zbl 1063.81070](#)

J. Phys. A, Math. Gen. 37, No. 14, 4267-4281 (2004).

The authors first show that 3 current unconventional Schrödinger equations (with deformed canonical commutation relation resp. position-dependent effective mass resp. curved space) are equivalent if their relevant functions (deforming function resp. position-dependent mass resp. diagonal metric) satisfy a simple relation. Then they study a Coulomb problem with standard potential and a deforming function linear in r . They determine spectrum and wavefunctions by using all 3 different interpretations. They get only a finite number of bound states (in correspondence to the old result for the Coulomb potential in a space with constant negative curvature).

Reviewer: [Evelyn Weimar-Woods \(Berlin\)](#)

MSC:

[81R50](#) Quantum groups and related algebraic methods applied to problems in quantum theory

Cited in **53** Documents

[81U15](#) Exactly and quasi-solvable systems arising in quantum theory

[81R10](#) Infinite-dimensional groups and algebras motivated by physics, including Virasoro, Kac-Moody, W -algebras and other current algebras and their representations

[81Q99](#) General mathematical topics and methods in quantum theory

Keywords:

[unconventional Schrödinger equations](#); [Coulomb problem](#)

Full Text: [DOI](#) [arXiv](#)