

## $Y(\mathfrak{sl}(2))$ Algebra Application in Extended Hydrogen Atom and Monopole Models

TIAN Li-Jun,<sup>1,3</sup> ZHANG Hong-Biao,<sup>1,2,3</sup> JIN Shuo,<sup>1,3</sup> and XUE Kang<sup>2</sup>

<sup>1</sup> Theoretical Physics Division, Nankai Institute of Mathematics, Nankai University, Tianjin 300071, China

<sup>2</sup> Department of Physics, Northeast Normal University, Changchun 130024, China

<sup>3</sup> Liuhui Center for Applied Mathematics, Nankai University and Tianjin University, Tianjin 300071, China

(Received: 2003-5-28; Revised: 2003-11-10)

**Abstract:** We present the extended hydrogen atom and monopole-hydrogen atom theory through generalizing the usual hydrogen atom model and with a monopole model respectively, in which  $Y(\mathfrak{sl}(2))$  algebras are realized. We derive the Hamiltonians of the two models based on the  $Y(\mathfrak{sl}(2))$  and the generalized Pauli equation. The energy spectra of the systems are also given in terms of Yangian algebra and quantum mechanics.

PACS: 02.20.-a, 03.65.-w

Key words: Yangian,  $Y(\mathfrak{sl}(2))$ , loop algebra, extended hydrogen, monopole

[\[Full text: PDF\]](#)

Close