Hyperincursive Algorithms of Classical Harmonic Oscillator Applied to Quantum Harmonic Oscillator Separable Into Incursive Oscillators

DANIEL M. DUBOIS

Centre for Hyperincursion and Anticipation in Ordered Systems (CHAOS)
Institute of Mathematics B37
Grande Traverse 12, BE-4000 LIEGE, Belgium
http://www.sia.hec.ulg.ac.be, ddubois.chaos@gmail.com

This paper will first survey the hyperincursive and incursive algorithms to discretize the classical harmonic oscillator. These algorithms show stable orbital with the conservation of energy. This paper will then apply these hyperincursive and incursive algorithms to the quantum harmonic oscillator. The hyperincursive quantum harmonic oscillator is separable into two incursive quantum harmonic oscillators. Numerical simulations confirm the stability of these hyperincursive and incursive algorithms.

Keywords: Harmonic oscillator, Hyperincursive algorithms, Incursive oscillator.