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Golden Quantum Oscillator and Binet-Fibonacci Calculus

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(Submitted on 21 Jul 2011)

The Binet-Fibonacci formula for Fibonacci numbers is treated as a q-number (and q-operator) with Golden ratio bases $q=\phi$ and $Q=-1/\phi$. Quantum harmonic oscillator for this Golden calculus is derived so that its spectrum is given just by Fibonacci numbers. Ratio of successive energy levels is found as the Golden sequence and for asymptotic states it appears as the Golden ratio. This why we called this oscillator as the Golden oscillator. By double Golden bosons, the Golden angular momentum and its representation in terms of Fibonacci numbers and the Golden ratio are derived.

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