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Spectroscopic study of some diatomic molecules via the proper quantization rule B. FALAYE, IPN, Mexico City, Mexico — Spectroscopic techniques are very essential tools in studying electronic structures, spectroscopic constants and energetic properties of diatomic molecules. These techniques are also required for parametrization of new method based on theoretical analysis and computational calculations. In this research, we apply the proper quantization rule in spectroscopic study of some diatomic molecules by solving the Schrödinger equation with two solvable quantum molecular systems-Tietz-Wei and shifted Deng-Fan potential models for their approximate nonrelativistic energy states via an appropriate approximation to the centrifugal term. We show that the energy levels can be determined from its ground state energy. The beauty and simplicity of the method applied in this study is that, it can be applied to any exactly as well as approximately solvable models. The validity and accuracy of the method is tested with previous techniques via numerical computation for H_2 and CO diatomic molecules. The result also include energy spectrum of 5 different electronic states of NO and 2 different electronic state of ICl.

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