Thermodynamics properties of a Schrdinger particle interacting with general molecular potential

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Abstract: We explore the thermodynamics properties such as, mean energy U, specific heat C, free energy F and entropy S, of the non-relativistic spinless particles interacting with general molecular potential (GMP) by using the vibrational partition function Z which depends on the energy eigenvalues obtained for GMP potential. We give also some numerical analysis for each thermodynamics properties graphically.

Keywords and phrases: Thermodynamics properties, Schrdinger particles, General molecular potential.
Acknowledgement: This study was supported by the Research Fund of Mersin University in Turkey with the project number: 2015-AP4-1244.

Twenty years of the q-Bernstein polynomials: achievements and perspectives

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Abstract: The Bernstein polynomials were introduced in 1912 by S. N. Bernstein, who used them to provide an elegant proof of the Weierstrass Approximation Theorem. Subsequently, many remarkable properties and important applications of these polynomials were discovered, while a great number of generalizations and analogues were introduced.

Generalized Bernstein polynomials based on the q-integers, otherwise known as q-Bernstein polynomials, were defined by G. M. Phillips in 1997 and studied by a number of researches from different angles during the last decades. When $q = 1$, these polynomials coincide with the Bernstein ones, while, for $q \neq 1$, we obtain new polynomials. Conventionally, the name 'q-Bernstein polynomials' is reserved for the case $q \neq 1$.

It has been known that the q-Bernstein polynomials inherit some properties of the classical Bernstein polynomials. For example, they possess the end-point interpolation property, leave linear functions invariant, and admit representation via divided differences. However, the theory of the q-Bernstein polynomials is not reduced to drawing analogies between the classical case and the q-one. Even for the results that can be viewed as direct generalizations of those known, their study either requires different tools or leads to problems which cannot even arise in the classical setting, such as, for example, the dependence of outcomes on parameter q or the analytical and geometric properties of the limit operators. Their investigation reveals some new phenomena and also establishes new connections between the relatively narrow class of operators and other areas, not only inside approximation theory, but also within functional analysis, algorithms, complex analysis, and others.