

# Deformed Gas of Tamm-Dancoff Type Boson Oscillators: Algebra and Thermodynamics

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In this talk, we consider the  $q$ -deformed bosonic Tamm-Dancoff (TD) oscillator algebra, and present its representative properties. Then, we discuss the high- and low-temperature thermostistical properties of the  $q$ -Bose gas model constructed by the TD-oscillators. In this framework, a generalized Bose-Einstein distribution function and other thermodynamical functions such as the internal energy and the entropy are derived in terms of the model deformation parameter  $q$ , which has values greater than one. As an application of the TD-type Bose gas model, we discuss the conditions under which the Bose-Einstein condensation would occur in such a model. Beside an analysis on the behaviours of the low-temperature thermodynamical functions of the system, it is specifically shown that the critical temperature of the TD-type Bose gas increases with the values of the deformation parameter  $q$ . Consequently, the present deformed boson model would be useful for studies on some interacting theories of bosons in quantum systems. Acknowledgements: This work is supported by the Scientific and Technological Research Council of Turkey (TUBITAK) under the project No: 113F226.