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Zero Point Energy

Zero Point Energy: Planck Radiation Law **H. Vic Dannon**

Abstract: The assumption of discrete radiation energy in Planck's 1901 radiation law, conflicted with Planck's belief in radiation of continuous waves. To reconcile his quantum hypothesis with his conception of wave radiation, he avoided the conclusion that radiation energy must be made of particles, and postulated that radiation is a transition between the energy levels of an oscillator. Furthermore, ignoring the symmetry between emission and absorption, he maintained that the absorption of radiation energy is continuous.

Under these assumptions, Planck derived in 1912, a second radiation law in which zero point energy appears.

We show that Planck's derivation of his 1912 radiation law only recovers the Zero Point Energy that he unknowingly assumed in his model from the start.

Furthermore, the distribution law of Planck's 1912 radiation law is, in fact, the approximated Boson Statistics of Planck's 1901 radiation law.

Our main result is that Planck's ZPE radiation law is equivalent to the combined three assumptions of Zero Point Energy Hypothesis, the Quantum Law, and the approximated Boson Statistics distribution law.

The validity of Planck's 1912 radiation law, and the existence of Planck's Zero Point Energy are doubtful.

Zero Point Energy: Thermodynamic Equilibrium and Planck Radiation Law **H. Vic Dannon**

Abstract: In a recent paper, we proved that Planck's radiation law with zero point energy is equivalent to the combined assumptions of zero point energy hypothesis, the quantum law and the approximated Boson statistics.

Here, under these three assumptions, we apply the principle of maximal entropy to show that Planck's radiation law with zero point energy is obtained at a state of thermodynamic equilibrium.