Abstract Submitted
for the APR06 Meeting of
The American Physical Society

Bose-Einstein Statistics and Fermi-Dirac Statistics: A Logical Error TEMUR Z. KALANOV, Home of Physical Problems, Pisatelskaya 6a, 700200 Tashkent, Uzbekistan — The critical analysis of Bose-Einstein statistics and Fermi-Dirac statistics—consequence of Bose's method—is proposed. The main result of the analysis is as follows. (1) In accordance with the definition, Bose-Einstein (B-E) and Fermi-Dirac (F-D) distribution functions $f^s_{(B-E)}$, $f^s_{(F-D)}$ are the average values of the random quantity: $f^s \equiv \varepsilon^s/\varepsilon^s_1$, $\varepsilon^s \equiv \sum\limits_r \varepsilon^s_r p^s_r$, $p^s_r = p^s_0 \exp\left[-(\alpha + \beta\varepsilon^s_1)r\right]$, $r = 0,\ 1,\ \ldots \quad (B-E)$, $r = 0,\ 1 \quad (F-D)$ where f^s is the average number of the noninteracting monoenergetic identical quantum particles in the s-layer cell; ε^s_1 is energy of one particle of kind s; p^s_r is the probability that energy takes on the value $\varepsilon^s_r = \varepsilon^s_1 r \equiv (\alpha + \beta\varepsilon^s_1)r/\beta$; $1/\beta \equiv T$ is temperature; $\alpha \equiv -\beta\mu$ is degeneration parameter; μ is chemical potential. (2) In accordance with the logic law of identity, $p^s_r \equiv p^s_r$, $\varepsilon^s_r = \varepsilon^s_1 r \equiv (\alpha + \beta\varepsilon^s_1)r/\beta$. Hence, $\alpha \equiv 0$. Thus, $\mu \equiv 0$ and, consequently, Bose-Einstein statistics and Fermi-Dirac statistics represent logical error.

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Date submitted: 28 Dec 2005 Electronic form version 1.4