Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Proposed Experimental Test of Gall's Predicted Isochromatic Black Body Displacement Law CLARENCE A. GALL, Universidad del Zulia, Maracaibo, Venezuela — The test of any Black Body Distribution function is how well it satisfies: Stefan-Boltzmann law $\left(I = \sigma T^4\right)$; Wien's isothermal displacement law $(\lambda_m T = b)$ and the maximum isothermal emitted intensity condition $\left(I_{\lambda_m} \propto T^5\right)$. Gall's function $\left(I_\lambda = \sigma \frac{T^6}{b^2} \lambda e^{-\frac{\lambda T}{b}}\right)$ satisfies these conditions exactly and unlike all previous candidates employs the original empirical constants (σ, b) in its formulation. Distinct from Planck and all others, it predicts an isochromatic displacement law: $\lambda T_m = 6b$, where T_m is the temperature of maximum emitted intensity for a given λ. The associated maximum isochromatic emitted intensity should satisfy $I_{T_m} \propto \lambda^{-5}$. At wavelengths of 20, 25 and 29 μm, T_m is calculated to be 870, 696 and 600 K respectively. In this range $(T_m < 1000\,K)$, temperatures can be measured without using the colour temperature. Gall's exact distribution function seriously questions Planck's inexact function. This proposed test is imperative as the existence of an isochromatic maximum intensity at T_m would affirm Gall's prediction of a crossover wavelength above which a colder body would emit with greater intensity than a hotter one. Its non-existence would reassert support for Planck's traditional notion that a hotter body always emits more intensely than a colder one throughout the entire EMR spectrum (http://sites.google.com/site/purefieldphysics).

Clarence A. Gall
Postgrado de Ingenieria, Universidad del Zulia, Maracaibo, Venezuela

Date submitted: 04 Sep 2009 Electronic form version 1.4