Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Inference of Schrödinger Equation from Classical-Mechanics Solution[1] JX ZHENG-JOHANSSON, IOFPR, SWE, P-I JOHANSSON, Uppsala Univ, SWE — We set up the classical wave equation for a particle formed of an oscillatory massless charge, traveling at velocity v in a potential $V(X)$ in a one-d box along X axis, and its electromagnetic waves $\{\varphi_p^j\}$ (as virtual or "hidden" processes) as: $[c^2 - \frac{V}{m}]\frac{\partial^2\psi}{\partial X^2} = \frac{\partial^2\psi}{\partial T^2}$ (1). Where $\psi = \sum \varphi_p^j$; $p =$ *incident* or *reflected*, $j = \dagger$ or $\ddagger$ for $\angle[c,v] = 0$ or π, c velocity of light, $M = m\sqrt{1-(v/c)^2} = \frac{h\Omega}{2\pi c^2}$ the particle's rest mass, $\frac{\Omega}{2\pi}$ wave frequency for $v = 0$, and h Planck constant. For V =const, Eq (1) has the plane wave solutions: $\{\varphi_p^j = C_1 e^{i(K^j X - \Omega^j T)}\}$; $K^j(j = \{{\dagger \atop \ddagger}\}) = \frac{K}{1 \mp v/c}$ is a Doppler-displaced wavevector; $\Omega^j = K^j c$. From $\sum \varphi_p^j$, we get a standing beat, or de Broglie phase wave for the particle total motion: $\psi = 4C_1 \cos(KX) e^{i(\Omega + \frac{\Omega_d}{2})T}\Psi$. Where $\Psi = C\sin(K_d X)e^{-i\frac{\Omega_d}{2}T}$ describes the particle motion, and $K_d = \sqrt{(K^\dagger - K)(K - K^\ddagger)} = (\frac{v}{c})K$ the de Broglie wavevector; $\Omega_d = vK_d$. For V varying, we get similarly a ψ and Ψ from sums of partial plane waves from all of infinitesimal $(X_i, X_i + \Delta X)$. We can in turn subtract (1) by itself but with $v = 0$, getting an equation for Ψ: $[-\frac{\hbar^2}{2M}\frac{\partial^2}{\partial X^2} + V(X)]\Psi = i\hbar\frac{\partial\Psi}{\partial T}$, which is equivalent to the Schrödinger equation. (The so represented QM invites not the so-called EPR paradox.)

[1]JXZJ & P-IJ, *Unification of Classical, Quantum and Relativistic Mechanics and the Four Forces*, Nova Science, NY, 2005; *Quantum Theory and Symmetries IV*, ed VK Dobrev, Heron Press, 2006.

Dr JX Zheng-Johansson
Inst. of Fundamental Physics Research, 611 93 Nyköping, Sweden

Date submitted: 05 Dec 2005 Electronic form version 1.4