1014-11-1747 **Genghmun Eng*** (`genghmun.eng@aero.org`), 5215 Lenore Street, Torrance, CA 90503. *Deriving The Prime Number Theorem (PNT)and Littlewood Oscillations Using a Nonlinear Dynamical Equation Method.* Preliminary report.

Modeling Eratosthenes Sieve with sets of δ-functions gives a Prime Density, smoothable into $\rho_S(N)$. The fraction of integers not divisible by primes up to N can be smoothed into $\rho_D(N)$. Since primes $< N$ determine all primes in $Q = [N^1, N^2]$, which best gives $\rho_S(Q) \equiv \rho_D(N)$? A general model is $\rho_S(Q = N^{+\Lambda(Q)}) = \rho_D(N)$. If $\Lambda(Q) \Rightarrow \Lambda_o$ at large Q, then $\rho_D(Q)$ is governed by a nonlinear dynamical equation:

$$\mathbf{1}(d/dQ)\rho_D(Q) + \rho_D(Q)\rho_D(Q^{+1/\Lambda_o})/Q + Order[1/Q^2] \equiv 0,$$

giving $\rho_D(Q) = \mathbf{1}/[\Lambda_o ln(Q)]$ and $\rho_S(Q) = \mathbf{1}/ln(Q)$. Mertens' Theorem sets $\rho_D(Q) = 1/[\Lambda_F \, ln(Q)]$, with $\Lambda_F \approx 1.781$, giving a new elementary PNT proof. Let $\rho_D(Q) = 1/[\Lambda_o[1 + Z(Q)] \, ln(Q)]$ with $Z(Q) \ll 1$:

$$(d/dQ)Z(Q) + Z(Q^{+1/\Lambda_o})/[Q \, ln(Q)] \approx 0,$$

then $Z(Q) = \sum A_m/[ln(Q)]^{+\beta_m}$ with $\beta_m \equiv \Lambda_o^{+\beta_m}$. If $\Lambda_o > e^{(+1/e)} \approx 1.44$, complex β_m are allowed, deriving Littlewood Oscillations; all nearly periodic in $[ln \, ln(Q)]$. For the PNT, $Z(Q, \Lambda_F)$ is small, with $\beta_0(\Lambda_F \approx (1.2069 + \mathbf{i}1.6036)$, and $\beta_1(\Lambda_F) \approx (4.54656 + \mathbf{i}13.0248)$. (Received September 29, 2005)