

1167-81-178

Michael Maroun* (marounm@gmail.com). *Generalized Nonlinear Schrodinger Equation:
Self-Dynamics by Convolution.*

The Lamb shift is an unique signature of time-independent quantum vacuum fluctuations and self-interaction in Hydrogen. A novel generalized nonlinear equation of motion is constructed with a convolution kernel that can accommodate self-interaction in an essential nonlocal manner. The kernel can be constructed out of the time-independent Maxwell vacuum solutions. The solutions vary with dimension and thus so does the convolution kernel. The kernel can also be chosen to form a linear equation, the Korteweg–De Vries equation, and the Gross-Pitaevskii equation. Solutions are sought on the space $L^2(\mathbb{R}^d)$, but are also considered on the space of distributions not necessarily only by trivial set containment. The Maxwell kernel for $d = 1$ is linear and thus approximate solutions can be constructed for the nonlinear equation of motion on compact subsets of \mathbb{R} . (Received March 06, 2021)