1044-35-206 **Sihon H. Crutcher*** (sihon.crutcher@us.army.mil), US Army , Redstone Arsenal Building 5400, Redstone Arsenal, AL 35898, and **Albert J. Osei** (osei@oakwood.edu), Dept. of Mathematics and Computer Sciences, Huntsville, AL 35896. *A Theoretical Study of a Self Guided Light Beam with a Non-Local Potential.*

During the last few decades, solitons have been a subject of intense study in almost all areas of physics such as Bose-Einstein condensates, nonlinear optics, plasma physics, and hydrodynamics. Our study is focused on optical spatial solitons. Optical spatial solitons have been found useful applications for logic devices, optical pulse compression and all optical switching or "light guiding light". We continue a study of the equivalence particle principle applied to an optical spatial soliton which is a "narrow filament" or beam that maintains its existence in a waveguide. Using this principle, expressions for acceleration, spatial frequency, spatial period and other variables for a spatial soliton are derived from the solution of the basic Nonlinear Schrödinger Equation, the equation that describes spatial soliton propagation in a nonlinear media. With a very small refractive index perturbation these results agree well with numerical simulations of the Modified Nonlinear Schrödinger Equation. We show that if the expression of the acceleration is bounded the spatial soliton propagates with a swing effect. In this review, we apply a non-local potential to the Modified Nonlinear Schrödinger Equation with a small perturbation and describe the soliton beam characteristics. (Received September 02, 2008)