1056-49-1654 **Adam Attarian*** (arattari@unity.ncsu.edu), Box 8205, Department of Mathematics, Raleigh, NC 27695-8205, **Tallis J William** (wjtallis@ncsu.edu), Box 8205, Department of Mathematics, Raleigh, NC 27695-8205, **Hien T Tran** (tran@math.ncsu.edu), Box 8205, Department of Mathematics, Raleigh, NC 27695-8205, and **Lawrence Ives** (rli@calcreek.com), 690 Port Drive, San Mateo, CA 94404-1010. *Application of Nonlinear Optimization in the Design of a Doubly Convergent Multiple-Beam Electron Gun.*

In this work we design a new class of electron devices using nonlinear optimization techniques. Through the use of parametric 3D modeling and simulation software, we perform optimizations on physical device geometry while realizing several engineering design constraints. With the application of an optimization methodology, the repetitive task of parameter variation is automated, permitting a new generation of asymmetric electron devices to be designed. Specifically, we consider a doubly convergent electron beam where the beam converges both about the local gun axis as well as the larger device axis. Goal functions and optimization methodology will be discussed in detail. (Received September 22, 2009)