Abstract Submitted
for the SES21 Meeting of
The American Physical Society

Modeling the performance of a novel electrostatic quadrupole doublet ion beam lens NICHOLAS LOSCALZO, ANTHONY MENDEZ, Campbell University — The electrostatic quadrupole lens commonly used on low-energy ion beam lines is typically fabricated with cylindrical electrodes of radius equal to 1.15 times the bore radius of the quadrupole. Using the program SIMION we modeled a novel electrostatic quadrupole doublet ion beam lens constructed with football-shaped electrodes. We then analyzed the effects of this lens on low-energy ion beam transport as compared to the traditional quadrupole design. In this paper, we present comparisons of the focal error, $\delta f/f$, and effective emittance growth for a Gaussian beam, and we show that the novel electrode shape reduces phase space distortions introduced by lenses employing truncated cylinders.

Nicholas Loscalzo
Campbell University

Date submitted: 28 Sep 2021 Electronic form version 1.4