Particle Acceleration by Radially-Polarized Laser Beams

Yousef I. Salamin
Physics Department, American University of Sharjah, P. O. Box 26666, Sharjah, United Arab Emirates
ysalamin@aus.edu

Abstract:

My recent work on direct acceleration in vacuum of particles (electrons, protons, ions and bare nuclei) using radially-polarized laser beams, will be presented. After a brief discussion of radially-polarized light, the theory behind several accelerator configurations will be briefly described, including: (a) Single-beam acceleration, (b) Acceleration by two co-propagating (and counter-propagating) beams, and (c) A crossed-beam configuration. Results from elaborate simulations, pertaining to each configuration, will be shown and discussed briefly