Abstract Submitted
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The effect of laser-generated fields on the focusing of high density relativistic positrons[1] JOOHWAN KIM, University of California, San Diego, HUI CHEN, GERALD WILLIAMS, ANTHONY LINK, SHAUN KERR, Lawrence Livermore National Laboratory, FARHAT BEG, University of California, San Diego — High intensity lasers interacting with high Z targets facilitate a relatively high yield of MeV positrons. However, higher positron densities in the laboratory experiments is needed to achieve astrophysics relevant conditions and pair plasmas than the current experiments provide. Here, we report on novel target designs to increase the escaping positron yield and positron focusing effects for the same existing laser energy. The target utilizes strong fields in structured voids within a solid target, where laser-accelerated electrons are focused by self-generated magnetic field and positron are pushed toward target rear by electric fields. Numerical modeling predicts ˜10x increase in escaping positrons depending on the number of voids. It is also seen that escaped positrons can be focused by a curved target surface resulting in increased local positron density. Detailed simulation results and experimental measurement will be presented.

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