Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Particle resonance based laser acceleration control in an ion channel[1] FEIYU LI, CHENGKUN HUANG, PRASHANT SINGH, SASI PALANIYAPPAN, Los Alamos National Laboratory, Los Alamos, NM 87545 — Controlled electron acceleration via direct laser energy coupling in an ion channel is proposed based on a new insight into the involved particle-laser resonances. The latter is acquired by dropping the usual paraxial assumption and identifying the resonances for all allowed electron propagation angles. As a result, full resonances and corresponding electron injection are quantified using the angle explicitly. Applications to controlling electron trapping and optimizing beam divergence are examined. These findings are verified and augmented by test-particle simulations.

[1]Work supported by the LDRD program at Los Alamos National Laboratory.

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Date submitted: 30 Jun 2020 Electronic form version 1.4