Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Transition from Beam-Target to Thermonuclear Fusion in
High-Current Deuterium Z-Pinch Simulations\textsuperscript{1} DUSTIN OFFERMANN,
DALE WELCH, DAVE ROSE, CARSTEN THOMA, ROBERT CLARK, CHRIS
MOSTROM, Voss Scientific, LLC, ANDREA SCHMIDT, ANTHONY LINK,
Lawrence Livermore National Laboratory — Fusion yields from dense, Z-pinch plas-
mas are known to scale with the drive current, which is favorable for many potential
applications. Decades of experimental studies, however, show an unexplained drop
in yield for currents above a few mega-ampere (MA). In this work, simulations of
DD Z-Pinch plasmas have been performed in 1D and 2D for a constant pinch time
and initial radius using the code LSP, and observations of a shift in scaling are
presented. The results show that yields below 3 MA are enhanced relative to pure
thermonuclear scaling by beamlike particles accelerated in the Rayleigh-Taylor in-
duced electric fields, while yields above 3 MA are reduced because of energy lost by
the instability and the inability of the beamlike ions to enter the pinch region.

\textsuperscript{1}This research was developed with funding from the Defense Advanced Research
Projects Agency (DARPA).

Dustin Offermann
Voss Scientific, LLC

Date submitted: 14 Jul 2016

Electronic form version 1.4