Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Longitudinal compression of an ion beam in the NDCX experiment DALE WELCH, CARSTON THOMA, ATK Mission Research, PRABIR ROY, ENRIQUE HENESTROZA, SIMON YU, Lawrence Berkeley National Laboratory, ADAM SEFKOW, Princeton University — Heavy ion fusion and ion-driven high energy density physics require the acceleration, compression, and transverse focusing of an intense ion beam. Neutralized drift compression of an ion beam makes use of a temporal velocity tilt and a neutralizing plasma to achieve small pulse lengths.[1] Here, we consider the neutralized drift compression experiment (NDCX at Lawrence Berkeley National Laboratory) in which a 300 keV, 25-milliamp K^+ ion beam is given a 150-keV head-to-tail energy variation using a tilt core induction cell. Pulse compression and focusing are achieved in the presence of a neutralizing plasma. Given adequate charge neutralization, the compression ratio is limited only by the accuracy of the applied velocity tilt and longitudinal temperature of the beam. Compression ratios exceeding 50 have been measured in agreement with particle-in-cell simulations. [1] D. R. Welch, D. V. Rose, T. C. Genoni, S. S. Yu and J. J. Barnard, Nucl Instrum. and Meth. Phys. Res. A 544, 236-242 (2005).

Dale Welch
ATK Mission Research

Date submitted: 21 Jul 2005 Electronic form version 1.4