Abstract Submitted
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Towards GeV laser-driven ion acceleration[1] B.M. HEGELICH, L. YIN, B.J. ALBRIGHT, K.A. FLIPPO, D.C. GAUTIER, R.P. JOHNSON, S. LETZRING, R.C. SHAH, T. SHIMADA, J.C. FERNANDEZ, Los Alamos National Lab., A. HENIG, D. KIEFER, V. LIECHTENSTEIN, J. SCHREIBER, D. HABS, Ludwig Maximilian Univ. Munich, J. MEYER-TER-VEHN, S. RYKOVANOV, H.C. WU, Max Planck Inst. Quantum Optics Garching — Applications like ion-driven fast ignition (IFI) with heavy ions or laser-based hadron therapy require efficient laser-driven ion acceleration to $\sim 0.1 - 1$ GeV. The Break-Out Afterburner (BOA) [1] regime and the Phase-Stable Acceleration (PSA) [2] regime, also reported as Radiation Pressure Acceleration (RPA) [3], promise quasi-monoenergetic beams at such energies, with $\sim 10\%$ efficiency,. This talk summarizes our joint exploratory research program in this new and exciting area, emphasizing the realization of these mechanisms with today's lasers. The laser requirements are discussed, especially pulse contrast. The first experimental results are reported. [1] L. Yin et al., Laser & Part. Beams **24**, 1-8 (2006) [2] X. Zhang et al., Phys. Plasmas **14**, 123108 (2007) [3] A. P. L. Robinson et al., New J. Phys. **10**, 013021 (2008)

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