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Development of Fast Diagnostics for High intensity Ion beams

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Abstract

Ion beam neutralization and drift compression experiments are designed to study the compression of ion beams for high energy density physics (HEDP) and fusion energy research. In this experiment a 300-keV, 30mA K^+ ion beam was compressed to <5 nsec duration by a velocity tilt core in a one meter-long plasma column. We are developing several fast diagnostics, such as Faraday cups, wire current monitor (measured response in the range of 0.5 nsec) fast photo multiplier system combined with a fast aluminum-oxide scintillator and optical emission from a gas cloud to measure time-resolved beam distribution of short pulses. Simulation and experimental data will be presented.

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