Abstract Submitted
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Effect of material on precursor flow conditions and column formation in cylindrical wire arrays S. BOTT, S. LEBEDEV, S. BLAND, J. CHITTENDEN, M. SHERLOCK, M. HAINES, D. AMPLEFORD, G. HALL, C. JENNINGS, J. RAPLEY[1], J. PALMER, AWE Plc — The ablation phase of wire arrays drives streams of material to the common axis for long periods prior to implosion. Flow conditions determine the density profile encountered by the imploding array, influencing trajectory and hence kinetic energy at stagnation, and are entirely determined by array material. The effect of atomic mass on the formation of the precursor column is investigated experimentally. Variations in the column diameter, formation time, and expansion rates are found to be related to the radiative cooling and collisionality of precursor streams. The column formation mechanism is shown to be a radiatively-driven collapse resulting from rising on-axis density. Agreement with a kinetic model is found. Insulated wires will also be investigated. Precursor plasma flow will be compared to uncoated arrays to determine how this will alter array pre-fill and implosion trajectory. Research sponsored by Sandia National Laboratory, the SSAA program of NNSA under DOE Cooperative Agreement DE-FC03-02NA00057.

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