

## Target Injection Tracking and Position Prediction Update<sup>□</sup>

R.W. Petzoldt<sup>1</sup> and K. Jonestrask<sup>2</sup>

<sup>1</sup>*General Atomics, San Diego, California, Ronald.Petzoldt@gat.com*

<sup>2</sup>*Anderson Engineering, San Diego, California, KevinJ@alumni.princeton.edu*

To achieve high gain in an inertial fusion energy power plant, driver beams must hit direct drive targets with  $\pm 20$   $\mu\text{m}$  accuracy ( $\pm 100$   $\mu\text{m}$  for indirect drive). Targets will have to be tracked with even greater accuracy. The conceptual design for our tracking system, which predicts target arrival position and timing based on position measurements outside of the reaction chamber was previously described [1]. The system has been built and has begun tracking targets at the first detector station. Additional detector stations are being modified for increased field of view. After three tracking stations are operational, position predictions at the final station will be compared to position measurements at that station as a measure of target position prediction accuracy.

The as-installed design will be described together with initial target tracking and position prediction accuracy results. Design modifications that allow for improved accuracy and/or in-chamber target tracking will also be presented.

- [1] R.W. Petzoldt, M. Cherry, N.B. Alexander, D.T. Goodin, G.E. Besenbruch, and K.R. Schultz, "Design of an Inertial Fusion Energy Target Tracking and Position Prediction System," *Fusion Technology*, **39**, No. 2 678 (2001).

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