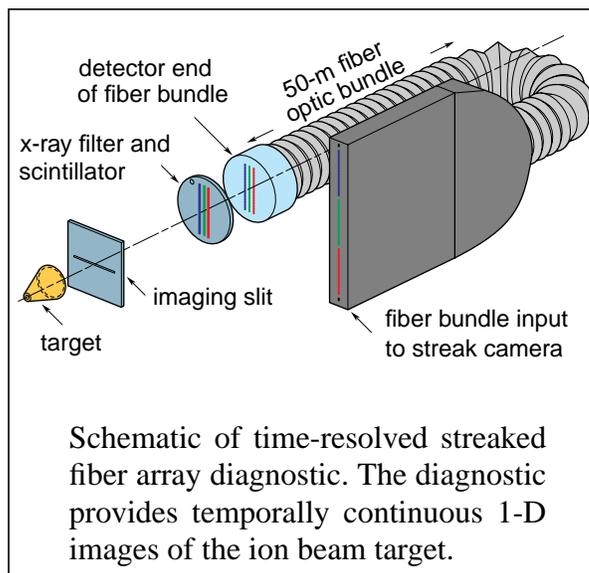


December 1993 Highlights of the Light Ion Inertial Confinement Fusion Program

On December 3 staff and managers discussed options to reduce the program to fit within the budget. We are stretching our milestone delivery dates and reducing the FTE level throughout the program. We now plan to attain three-digit hohlraum temperatures by March 1995 instead of by August 1994. For the present, the next two target series have been rescheduled to April/May and December instead of February and July.



We are investigating fabrication of the cylindrical target for the proposed April/May series. The parylene-coated gold hohlraum must withstand 3-Torr argon to eliminate the need for vacuum transport. In addition, the hohlraum must be glued to the target holder without being affected by glue-drying stresses or the flex in the holder. A target holder with brass rods twice as thick as previously used has proven successful.

The ratio of peak-to-background signal levels and the impulse response of readout systems for streak-camera-based diagnostics have been characterized. We find that a charge coupled device gives better resolution than film. The figure shows a typical arrangement of the one-dimensional imaging diagnostic.

We are assessing improved vacuum technology and glow discharge cleaning to reduce surface contamination of the diode hardware. We find that electropolishing of anode substrates reduces surface roughness by a factor of two. Two LiF-coated, focusing-geometry anodes with a four-micron finish should be ready for PBFA-II experiments by February to determine how much the ion divergence can be reduced.

Fifteen extraction diode shots were fired on SABRE. Initial tests of the new gas switches indicate a one-sigma jitter of < 2 ns, compared to > 5 ns before switch replacement. In addition, the ability to access PBFA-II experimental data has been enhanced by improvements to our local area computer network.

We are evaluating causes of the beam nonuniformity of ion sources on SABRE and on the TWOQUICK code. Beam uniformity at peak power is the same with and without erosion of the vacuum wave precursor; hence, the precursor may not be responsible. Other possibilities are instability-induced cross-field diffusion of sheath electrons or action by a different portion of the cathode feed that is not shielded by the extended cathode tip. Further experiments and simulations are planned to understand this nonuniformity.

Concrete was selected for the capacitor enclosure on the National Ignition Facility (NIF) because of low cost and fire resistance; the capacitor trays will be structural foam or fiberglass. The current design for the NIF target positioner is a cantilevered pole with two rotational and three translational degrees of freedom.

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