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FINAL TECHNICAL REPORT

DURIP Grant No. AFOSR-89-0036

(DURIP) HIGH SPEED CAMERA AND RF ENCLOSURE FOR INVESTIGATION OF PLASMA
EDGE CATHODE

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The equipment purchased under DARP Grant No. AFOSR-99-0136 is used in the investigation of the Plasma Edge Cathode Scheme. This research is supported by AFOSR Grant No. AFOSR-87-0154.

The High Speed Framing Camera Assembly has been constructed and assembled. It is dedicated to the analysis of the extracted electron beam from the plasma edge cathode. It records two images of the same event at different times at two separate locations on the film. Each image has a diameter of 35 mm on the film. The minimum exposure time is close to 5 nsec. The time delay between the two images can be adjusted starting from 0 nsec. The Image Scanner allows the evaluation of the recorded beam images inferring the shape of the effective plasma edge and the beam brightness of the electron beam.

The RF-Enclosure contains the recording oscilloscopes for two experiments investigating the electron extraction from the plasma edge and the investigation of the plasma jet itself (time-of-flight spectrometer). It also houses the data acquisition system for these two experiments. Electromagnetic signals generated by the plasma edge cathode experiment itself and by neighboring experiments are successfully shielded.