Developing Software to Analyze Plasma Expansion[1] JEFFREY MEI, Univ of Nevada - Reno — Shadowgrams are used to analyze the expansion speed of plasma. However, it is difficult to define the border of the plasma in a shadowgram because the border is turbulent and contains laser speckle. Prior techniques to define the edge of a rod were done partly by eye. However, by adding the subjective human element in the procedure, the results are less likely to be reproducible. In addition, for low resolution images, even a pixel difference may significantly change the measured expansion rate. Therefore, the computer program LengthAnalysis was developed as a way to obtain robust measurements of shadowgram plasma width. The edge of a shadowgram is defined by the largest change in contrast. LengthAnalysis utilizes the gray values obtained from the plot profile tool from the image processing program, ImageJ, to identify the areas of greatest change in contrast. Since the regions of greatest contrast change identify an edge, the difference between the two greatest regions of contrast yields the width. Though the idea is simple, laser speckle and the alignment of the target may alter the measurement of width. Laser speckle can move the regions of greatest contrast, while the slant of the target spreads out these regions in the plot profile.

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