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Sky K. Sjue* (sjue@lanl.gov). *Velocity and density reconstructions of detonation waves in conventional high explosives from proton radiographic images obtained at Los Alamos Neutron Science Center.*

We will discuss the imaging techniques used in proton radiography at Los Alamos, then discuss some approximations for the non-stationary chromatic blur due to non-constant energy loss of the protons through a dynamic experiment. A low order form for the density profile of a detonation wave in the high explosive will be assumed based on the ZND model. The effect of motion blur will be included due to integration over proton micro-pulses 5 nanoseconds wide for a duration of 50 nanoseconds in a single image. The time averaging will be performed consistently through a series of images. These assumptions will be subjected to a constant mass constraint to estimate the most likely density of the explosives in the reaction zone, the width of the reaction zone, and the velocity of the detonation wave, plus confidence intervals for these quantities of interest. The results from this forward analysis will be compared to an alternative analysis based on a more direct Abel inversion of the images. (Received February 28, 2020)