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A multi-cone x-ray imaging Bragg crystal spectrometer. MANFRED BITTER, K. W. HILL, LAN GAO, P. C. EFTHIMION, L. DELGADO-APARICIO, S. LAZERSON[1], N. PABLANT, Princeton Plasma Physics Laboratory — In a recent article, *see* Rev. Sci. Instrum. **87**, 11E333 (2016), we described a new x-ray imaging Bragg crystal spectrometer, which – in combination with a streak camera or a gated strip detector – can be used for time-resolved measurements of x-ray line spectra at the National Ignition Facility (NIF) and other high power laser facilities. The main advantage of this instrument is that it produces perfect images of a point source for each wavelength in a selectable spectral range and that the detector plane can be inclined by an arbitrary angle with respect to the crystal surface. These unique imaging properties are obtained by bending the x-ray diffracting crystal into a certain shape, which is generated by arranging multiple cones with different aperture angles on a common nodal line. In this paper, we present results from optical tests of these multi-cone structures and numerical results on the deteriorations of the spectral and spatial resolutions that may be caused by potential misalignments of the source, crystal, and detector.

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