Abstract Submitted
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X-Ray Diffraction: Shocked Crystals and Bragg's Law JUSTIN WARK, Department of Physics, University of Oxford — With the advent of 4^{th} generation light sources the technique of using x-ray diffraction to interrogate shocked crystalline samples has advanced significantly. The duration of the x-rays emitted by these remarkable machines ($<$ 100 fsec) is shorter than the period of the fastest phonons in the system, and the spectral purity and narrow divergence of the emission is vastly superior to that achievable with laser-plasma x-ray sources. One particular advantage that has been exploited in several experiments at LCLS is that the above characteristics allow the probing x-rays to be focussed to small spots, and good Debye-Scherrer diffraction patterns are regularly recorded by use of x-ray spots that are just a few tens of microns in diameter [1-3]. In this paper I will revisit some of the assumptions that are often used to estimate the form and intensity of the diffraction in these circumstances, and show that recent work dictates that some of our long-held beliefs may require rethinking [4]. [1] D. Milathianaki *et al*, Science, **342**, 220 (2013) [2] M.G. Gorman *et al*, Phys. Rev. Lett., **115**, 095701 (2015) [3] R. Briggs *et al*, Phys. Rev. Lett., **118**, 025501 (2017) [4] P.F. Fewster, Acta Cryst. **A70**, 257 (2014)

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