

High-pressure applications of glass capillary optics

Keith Brister

Cornell High Energy Synchrotron Source, Cornell University, Wilson Lab, Ithaca, NY 14853, U.S.A.

Recent advances in the design of glass capillary optics have led to the development of devices useful for high-pressure x-ray diffraction from powders in a diamond anvil cell. Experiments at CHESS have shown significant gains in intensity, at least a factor of ten, on data taken with a 300-micron-diameter sample.

Intensity gains naturally entail an increase in the divergence of the x-ray beam, however, many high-pressure experiments can tolerate this increased divergence without a loss of resolution. Due to the extremely low marginal cost of the capillaries and the ease with which one may align them, a high pressure beamline can offer users the ability to choose the divergence and spot size to suit the experiment.