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High-Pressure Quasi-Isentropic Loading and Unloading of Interferometer Windows on the Veloce Pulsed Power Generator TOMMY AO, JAMES ASAY, MARCUS KNUDSON, JEAN-PAUL DAVIS, Sandia National Laboratories — The Isentropic Compression Experiment technique has proven to be a valuable complement to the well-established method of shock compression of condensed matter. However, whereas the high-pressure compression response of window materials has been studied extensively under shock loading, similar knowledge of these materials under ICE loading is limited. We present recent experimental results on the isentropic compression of the high-pressure windows sapphire and LiF. It has previously been observed that c-cut sapphire yields under shock loading at the HEL of ∼15-18GPa, and subsequently loses transparency at higher stresses. However, it will be shown that under isentropic ramp wave loading sapphire appears to remain elastic and transparent at stresses well above 20GPa [D.B. Hayes et al, JAP 94, 2331 (2003)]. LiF is another frequently used window material in isentropic loading and unloading experiments, yet the unloading response of LiF is usually neglected. Research is in progress to measure strength properties of LiF for ramp loading and unloading. It will be shown how the strength of LiF may influence wave profile analysis and thus inferred material strength. Sandia is a multiprogram laboratory operated by Sandia Corp., a Lockheed Martin Company, for the US DOE's NNSA under Contract No.DE-AC04-94AL85000.

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