

Abstract Submitted  
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**X-ray blast windows with mechanically strengthened lithium<sup>1</sup>**

NINO PEREIRA, Ecopulse, Inc. — Z-pinch- and laser-produced X-ray sources not only emit the few-keV X-rays that are intended, but also X-rays that are much softer than desired, plasma, and hot gas. An X-ray filter along the line of sight easily suppresses the softer X-rays, but when the pulse is powerful enough it evaporates, to become a secondary source of material that must be stopped by an X-ray transmitting blast window. For the X-ray filter the best material is lithium metal: Li has the highest mass per unit area and largest heat capacity for a given X-ray transmission. Li would be a good candidate material for the blast window too if it were mechanically stronger. We show initial results on the strengthening of lithium by mixing it with lithium hydride powder, the only ceramic that would not decrease Li's X-ray transmission. Cooling the resulting Li-LiH cermet to 77 K increases the strength more than an order of magnitude (compared to room-temperature Li): cryogenically cooled Li-LiH is then just as strong, or perhaps stronger, than beryllium.

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