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**Transport of intense laser-driven proton beams in warm, dense plastic foams**[1] CHRISTOPHER MCGUFFEY, UC San Diego, WOLFGANG THEOBALD, LLE, JOOHWAN KIM, KRISH BHUTWALA, ADAM HIGGINSON, UC San Diego, MARKUS ROTH, OLIVER DEPPERT, TU Darmstadt, PHILIP M NILSON, LLE, MARK E FOORD, YUAN PING, LLNL, MINGSHENG WEI, LLE, FARHAT N BEG, UC San Diego — Chirped pulse amplified lasers have reached the kilojoule-petawatt class, and the secondary sources of radiation they produce are themselves now capable of driving unexplored physics. Laser-driven proton beams with MeV to 10s of MeV particle energy and 10s of J beam energy can now be the pump in innovative experiments such as isochoric heating of foams or solids to warm (>1 eV) or even hot (>100 eV), dense matter states. However, the transport behavior of such an intense beam through the plasma target is complex. To study the transport, we carried out an experiment with the OMEGA EP laser and simulations with the LSP particle-in-cell code. We present experimental measurements of laser-accelerated proton spectra from curved, engineered targets before and through two areal densities of carbonized resorcinol formaldehyde (CRF) foam and simulations of the beam transport within the foam. 2D images of K$\alpha$ emission from a solid Cu layer at the back of the foam shed insight into the beam transport, indicating a bright, directional beam.

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