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Recent Advances in Tailored Dynamic Compression¹ JEFFREY H. NGUYEN, JEREMY R. PATTERSON, DANIEL ORLIKOWSKI, LOUIS P. MARTIN, P. ASOKA-KUMAR, KLAUS WIDMANN, NEIL C. HOLMES, Lawrence Livermore National Laboratory — In the past few years, the functionally graded density impactor has been used in dynamic compression experiments that are tailored to reach previously inaccessible dynamic thermodynamic states beyond the principal Hugoniot and isentrope. These experiments demonstrated complex loading paths that included a combination of shocks, quasi-isentropic compressions, and controlled releases. The quasi-isentropic compression experiments last microseconds, and are capable of bridging the timescales of static experiments and current dynamic compression experiments. Some of the interesting experiments that were carried out included phase transition and equation of state studies. Our recent efforts have been concentrated on improving reproducibility and planarity of the impactors. Here, we will report the efforts and progresses on impactor manufacturing as well as experiments characterizing these impactors. We employed both line-VISAR and multi-PDV probes to characterize the planarity of the impactor as the target undergoes tailored dynamic compression.

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