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Improving diagnostics capabilities for dynamic loading experiments using high pulsed powers drivers THIERRY D'ALMEIDA, JEREMY VICH, YOHAN BARBARIN, GAEL LEBLANC, CAMILLE CHAUVIN, Commissariat à l'Energie atomique et aux énergies alternatives, THIERRY DUVAUT, Université de Reims Champagne Ardenne — The CEA operates several High-Pulsed Power (HPP) drivers dedicated to dynamic loading experiments. The aim of these experiments is to provide quantitative information about the dynamic behavior of various materials of interest including metallic and nonmetallic samples. Diagnosing such experiments has mainly relied on surface velocity measurements through laser-Doppler interferometry and current pulse measurements based on electromagnetic field sensors. Efforts were recently undertaken to significantly improve and extend the performance of diagnostics fielded on all of our HPP platforms. In addition to developing a robust pre-heating device suitable for all types of solids, we have implemented a novel photonic Doppler system for line and 2D discrete surface velocity measurements and are currently studying the feasibility of incorporating fiber optic-based ruby pressure gauges to the set of diagnostics. All of these developments are presented within the context of technical constraints associated with experiments in severe electromagnetic environments.

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