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## Overview of State of the Art Diagnostics of Plasma Accelerators

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Enormous progress has been made in Plasma Acceleration since its inception over three decades ago. Multi-GeV energy gains have been demonstrated both in particle and laser driven accelerators, with many facilities now routinely generating high quality, GeV-class beams. Experimental characterization of the various aspects of the accelerating structures, and the accelerated charge, and emitted radiation, has been an equally long and ongoing, parallel research effort. The very transient, evolving, microscopic nature of the underlying accelerating plasma waves, their luminal propagation, as well as the unique properties of the accelerated charge and radiation, all have posed a great diagnostic challenge, requiring the development of a novel class of probing techniques. We will present a brief summary of the properties that have been the targets of experimental characterization, such as the plasma wave's density structure, electric and magnetic field structure, the temporal evolution of these structures, or the injected charge within the plasma wave and post-exit, and an overview of the specific methods of characterization developed by researchers around the world, with particular challenges that each method poses. Emphasis will be placed on an overview of the latest advances in the diagnostic techniques

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