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The SPARTA project: designing a multistage plasma-accelerator facility

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Plasma acceleration promises to make high-energy and high-power accelerator facilities, such as linear colliders, cheaper and more compact. However, many aspects of plasma accelerators are still at a relatively low technology readiness level (TRL). Maturing the technology requires near-term applications with moderate requirements in all but the core aspects, which in particular includes staging and stability. The SPARTA (Staging of Plasma Accelerators for Realizing Timely Applications) ERC project aims to provide technical solutions for both staging and stability, and to combine these into a design for a medium-scale multistage plasma-accelerator facility aimed at strong-field QED experiments. Solutions include nonlinear plasma lensing for achromatic transport, and passive stabilization mechanisms. Here, we give an overview of the motivations, solutions, aims and current progress of the SPARTA project.

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