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Plasma accelerators for applications in health, photon science, and particle physics

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Plasma-based accelerators are becoming viable and attractive options as injectors for storage rings and as drivers for compact applications in photon science and health, with profound implications on the widespread availability of miniature high-energy particle sources. Recent technological and methodical advances have resulted in largely improved beam stability, control, and quality. This progress is fueled by merging advanced concepts from established accelerator science including intelligent feedbacks, high-resolution diagnostics, and mature control schemes with modern plasma and laser technology.

In this presentation the state-of-the-art will be reviewed in the context of concrete applications pursued at DESY in Hamburg. This includes plans to realize compact injectors for storage rings, novel modalities in medical imaging, and high efficiency energy-booster modules suitable for upgrades of existing and future facilities in photon science and particle physics.

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