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ALEGRO - an international study group to promote advanced accelerators for particle physics applications

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The development of advanced acceleration techniques has been rapid over the last decade. Nowadays, acceleration concepts based on plasmas have not only demonstrated field strengths in the multi-GV/m regime enabling ultracompact high-energy machines, but have also made strides in terms of short- and long-term stability and control aided by novel machine learning algorithms, and demonstrated the beam-quality required to support free-electron laser gain and medical applications. ALEGRO, the Advanced LinEar collider study GROup of the ICFA ANA panel, recently held their first post-pandemic workshop to review current developments in the context of a future application of GV/m acceleration techniques for particle physics. This workshop highlighted that while many challenges remain for a future plasma-based collider, substantial progress could be achieved on the path to this ultimate goal. This presentation discusses these developments in the context of ALEGRO and the European Strategy for Particle Physics Accelerator R&D Roadmap.

Presenter: OSTERHOFF, Jens (DESY)

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