

# Staging Laser Wakefield Acceleration Research aiming for Repeatable GeV-class Accelerator

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A staging laser wakefield acceleration (LWFA) research that aims at table-top sized free-electron laser (FEL) under the ImpACT program in Japan will be reviewed. LWFA is expected to be a novel scheme for accelerating electron beams beyond GeV-class energy with compact devices. In recent studies, the pointing stability of the electron beams from LWFA has been dramatically improved by plasma-micro-optics (PMO) that is plasma device functioning as a focusing and optical-guiding tool for intense laser pulses [1]. The PMO enables electron beams to be precisely controlled and/or transported by the beam-optics of conventional accelerators. With these techniques a staging LWFA has been demonstrated successfully, and high quality quasi-mono-energetic beams below the 100 MeV range are produced with good repeatability as an injector. Sub-GeV electron beams are also produced with a 4 mm-booster laser wakefield. These results will be presented and discussed. A future experimental site at SPring-8/RIKEN (Fig.1) is being prepared for the exclusive use of the laser-driven FEL. The plans towards a test area on the laser-driven FEL at SPRING-8 /RIKEN will be presented.

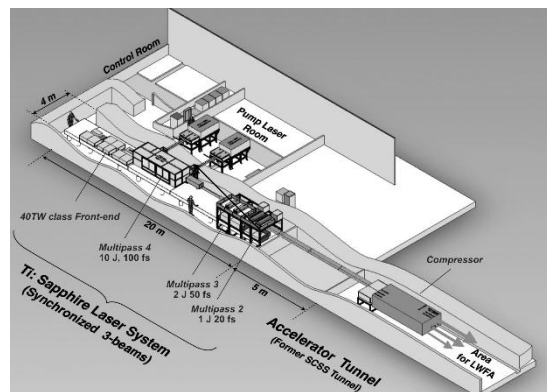


Figure 1. A bird's-eye view of laser system for LWFA platform at Spring-8/RIKEN site.

## References

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