

# Diagnostics of the MeV level LWFA electron bunches stability at 1kHz repetition rate

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Generation of the relativistic electron beams using Laser Wakefield Acceleration technology (LWFA) has recently achieved Technology Readiness Level (RTL) sufficient to deliver MeV level electron beams for user experiment. Recently built LWFA accelerators can be operated at 1 kHz pulse repetition rate. The LWFA technology enables the production of electron beams with the ultra-shot time structure, ultra-high peak beam current unachievable with conventional acceleration methods. However, beam pointing, divergence, and energy spectrum instability are major trade-offs of the technique.

The proposed beam diagnostic method is based on the visualization of the beam cross-section on the phosphorous screen in one dimension using a kHz frame rate high-resolution linear camera and sub-nanosecond photodiode to read out its visible spectrum luminance and so, the electron beam intensity.

Presented experimental data are required for analysis of the laser and gas target performance and stability.

## Alternate track

### I read the instructions above

Yes

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