



Contribution ID: 124

Type: Poster

Fast Beam Pointing Stabilization for High Power Laser System

Thursday, 29 September 2016 18:40 (1 hour)

Electron acceleration using short pulse high power laser is one of the scheme proposed to reduce the size of the future accelerator.

Different scheme has been proposed to increase the acceleration length and the final electron energy, like use of gas filled capillary. Advance target design increases the demand on the quality of the laser beam, in particular to the pointing stability, that it is required to be better than the focal spot, of the order of few microradian.

A point stability of that level is difficult to achieve on large size high power lasers, where the laser system span on different rooms and/or floors. Those systems could also be subjected to external vibrations, i.e. produced by other facilities nearby.

In this communication we present the development of a beam stabilization system able to operate a 3in mirror with sub-millisecond response time and it is capable to suppress 50Hz vibration by a factor 10.

This system is planned to be tested on the PW class TiSa laser Gemini at Central Laser Facility.

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Session Classification: PS3: Poster session