

Inverse Compton X/ γ Source Based on Laser Wake-Field Accelerator

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A new generation of accelerator-based hard X/ γ -ray sources driven exclusively by laser light will be discussed¹. One ultrahigh intense CPA laser pulses will act as two means: first used to accelerate electrons by laser-driven wake-field (LWFA) to hundreds MeV, and second, from split beam or LWFA-leftover energy reflected by plasma mirror, to collide on the electron for the generation of X/ γ -rays by inverse Compton scattering (ICS). Such all-laser-driven X/ γ source have recently been demonstrated to be energetic, tunable, narrow/broad in bandwidth, short pulsed and well collimated. Simulation show highly intensive gamma energy harmonics can also generated these sources^{2,3}. Such characteristics, especially from a compact source, are highly advantageous for numerous advanced X-ray applications. Moreover, preliminary plan of laser wake-field accelerator and radiation source in future multi-PW facility, e.g. ELI-beamlines, will be presented⁴.

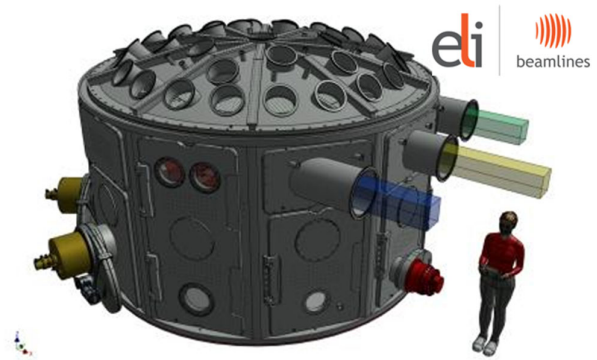


Fig. 1: P3 chamber will be used for high field science

References

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