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The laser system of very compact inverse Compton scattering γ -ray source

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We present the design and experiment of a laser system for the very compact inverse Compton scattering (ICS) γ -ray source (VIGAS). The laser system comprises a photo injector drive laser and a scattering laser system. The photocathode drive laser system produces ultraviolet (UV) pulses with 575 μJ energy, 9.4 ps FWHM pulse width, and 10 Hz repetition at 267 nm central wavelength, which illuminates a photo injector to generate a high-quality electron beam. The ICS laser system produces two alternative intense ultrashort laser pulses with 800 nm (3 J) and 400 nm (0.8 J) central wavelengths for interacting with the electron beam, respectively. The two laser systems are phase-locked to a 2856 MHz master clock signal with a time jitter of 47 fs and 55 fs, respectively.

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Primary author: TIAN, Qili (Tsinghua University in Beijing)

Co-authors: LIU, Xing (Tsinghua University in Beijing); LU, Xinyi (Tsinghua University in Beijing); YAN, Lixin (Tsinghua University in Beijing); DU, Yingchao (Tsinghua University in Beijing); GAO, Bin (Chinese Academy of Sciences); ZHENG, Lianmin (Tsinghua University in Beijing); LI, Renkai (Tsinghua University in Beijing); HUANG, Wenhui (Tsinghua University in Beijing); TANG, Chuanxiang (Tsinghua University in Beijing)

Presenter: TIAN, Qili (Tsinghua University in Beijing)

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