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Experimental Study on Fast Electrons Transport in Ultra-intense Laser Irradiated Solid Targets by Transition Radiation ZHENG ZHIJIAN, WANG GUANGCAN, GU YUQIU, National Key Laboratory of Laser Fusion, Research Center of Laser Fusion, CAEP — The experiment was performed with SILEX laser facility(Ti-sapphire) at LFRC in China. The SILEX parameter: wavelength $0.8\mu\text{m}$, duration 35fs, output power 280TW, contrast $5*10^5$, The focal spot $\phi 10\mu\text{m}$ (F/1.7), intensity on target surface $1*10^{19}\text{W}/\text{cm}^2$ (F/3). The main diagnostic equipments are the electron spectrometer, OMA spectrometer, optical streak camera. Some experimental results are given: The spectrum of optical emission from rear surface is rather narrow around some particular frequencies(1ω , 2ω , 3ω), We ascribe and confirm that the spike-like spectral line that is coherent transition radiation; The coherent light is also seen on time-integrated image with ring-pattern due to Weibel instability of the fast electron transport; Obtained experimental curve of target thickness vs OTR image intensity is relative to mean free path of fast electron; The measuring optical transition radiation(OTR) duration of 171ps much longer than 1ps duration of fast electron transport target, the possible explanation is that the OTR duration to be determined magnetic diffusion time.

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