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# Laser-induced orientation transformation of a conjugated polymer thin film with enhanced vertical charge transport

*Sangmin Chae[1], Ahra Yi[1], Hyun Hwi Lee[2]*, Jiyeon Choi[3]*, Hyo Jung Kim[1]**

1. Department of Organic Material Science and Engineering, Pusan National University, Busan 46241, South Korea

2. Pohang Accelerator Laboratory, POSTECH, Pohang 37673, South Korea

3. Department of Laser and Electron Beam Application, Korea Institute of Machinery and Materials (KIMM), Daejeon 34103, South Korea

E-mail to: hyojkim@pusan.ac.kr, jchoi@kimm.re.kr, hhleec@postech.ac.kr,

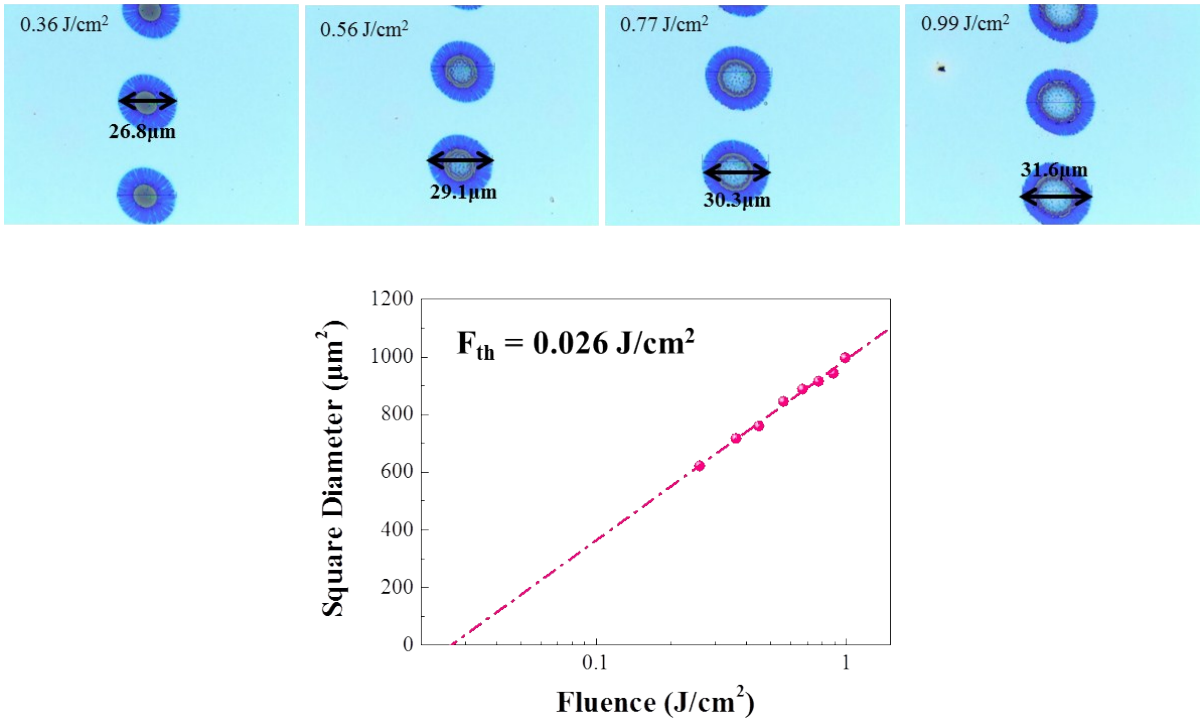


Figure S1. Optical microscope images of the laser ablated P3HT films as a function of laser fluences with Gaussian beam profiles, and P3HT ablation threshold fluence calculation by liu plotting.

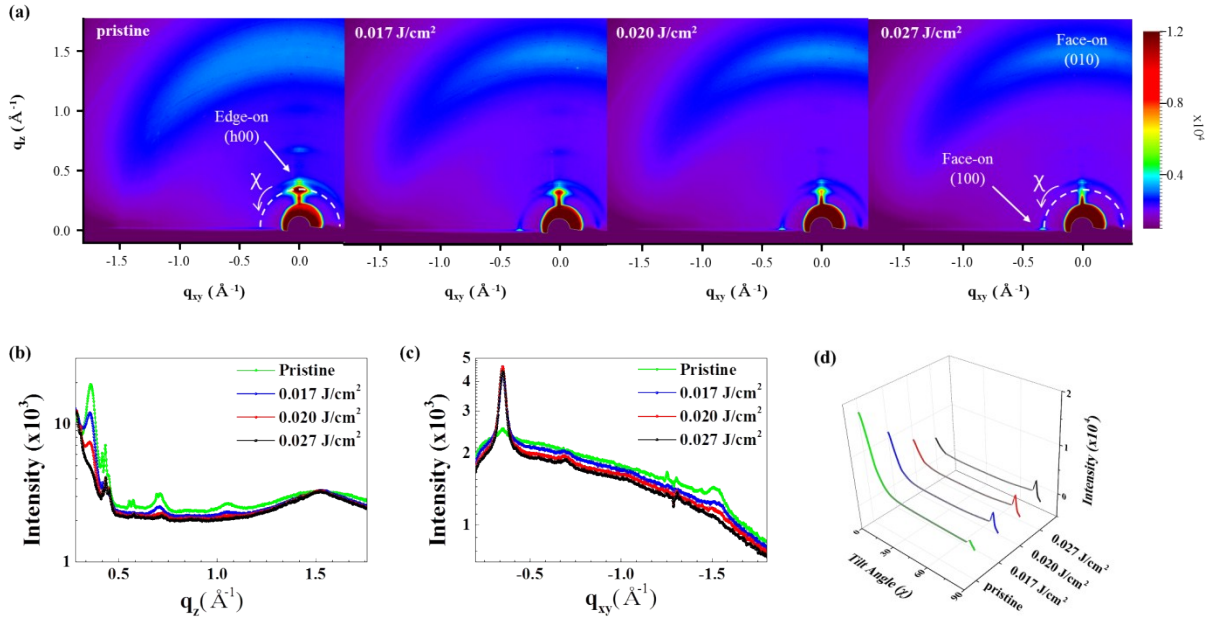


Figure S2. a) 2D GIWAXS images of the pristine and laser-irradiated P3HT thin films of 50 nm thickness. (angle of incidence at 0.10°) b) Vertical (out-of-plane) line cuts from the 2D images, and c) horizontal (in-plane) line cuts from the 2D. d) Circular line cuts of (100) peaks.

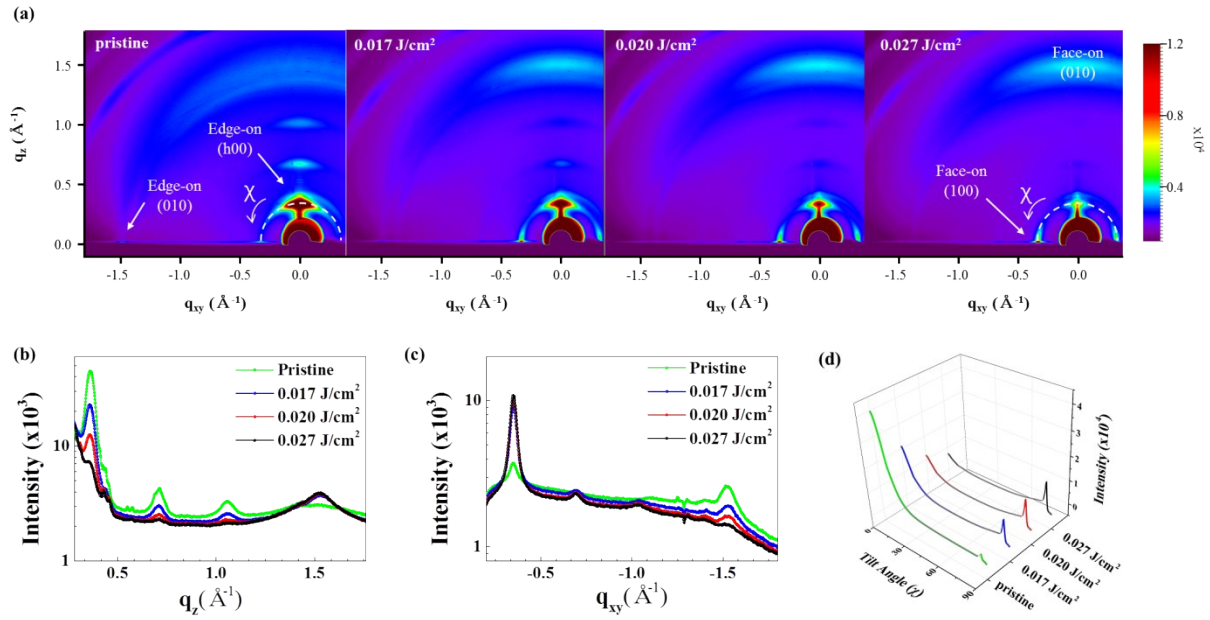


Figure S3. a) 2D GIWAXS images of the pristine and laser-irradiated P3HT thin films of 50 nm thickness. (angle of incidence at 0.15°) b) Vertical (out-of-plane) line cuts from the 2D images, and c) horizontal (in-plane) line cuts from the 2D images. d) Circular line cuts of (100) peaks.

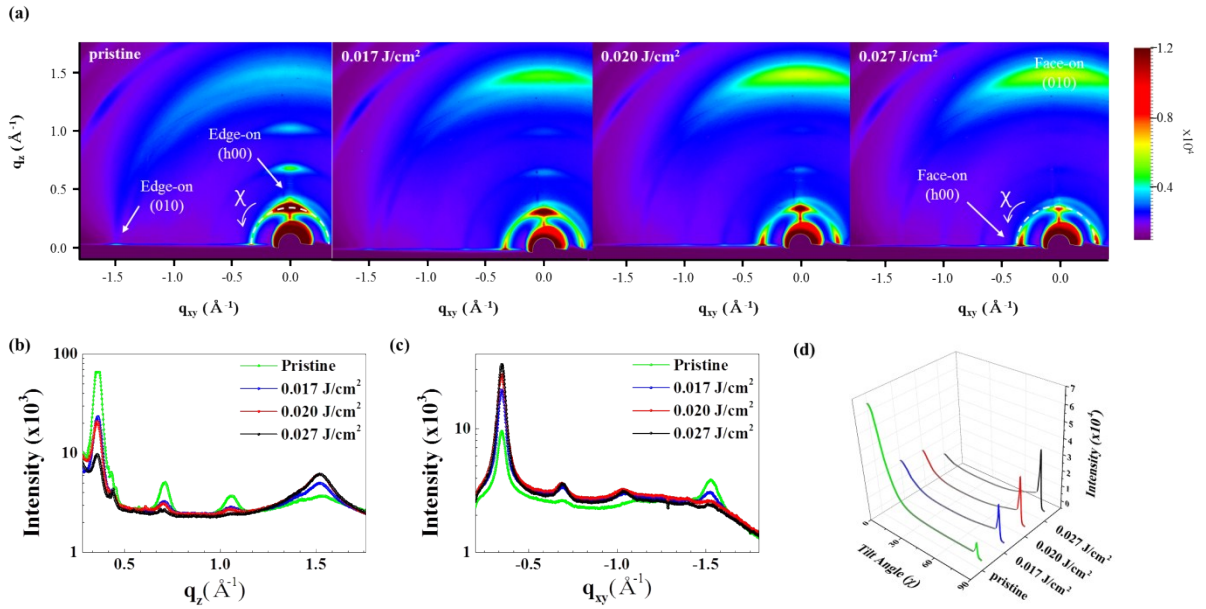


Figure S4. a) 2D GIWAXS images of the pristine and laser-irradiated P3HT thin films of 30 nm thickness. b) Vertical (out-of-plane) line cuts from the 2D images, and c) horizontal (in-plane) line cuts from the 2D images. d) Circular line cuts of (100) peaks.

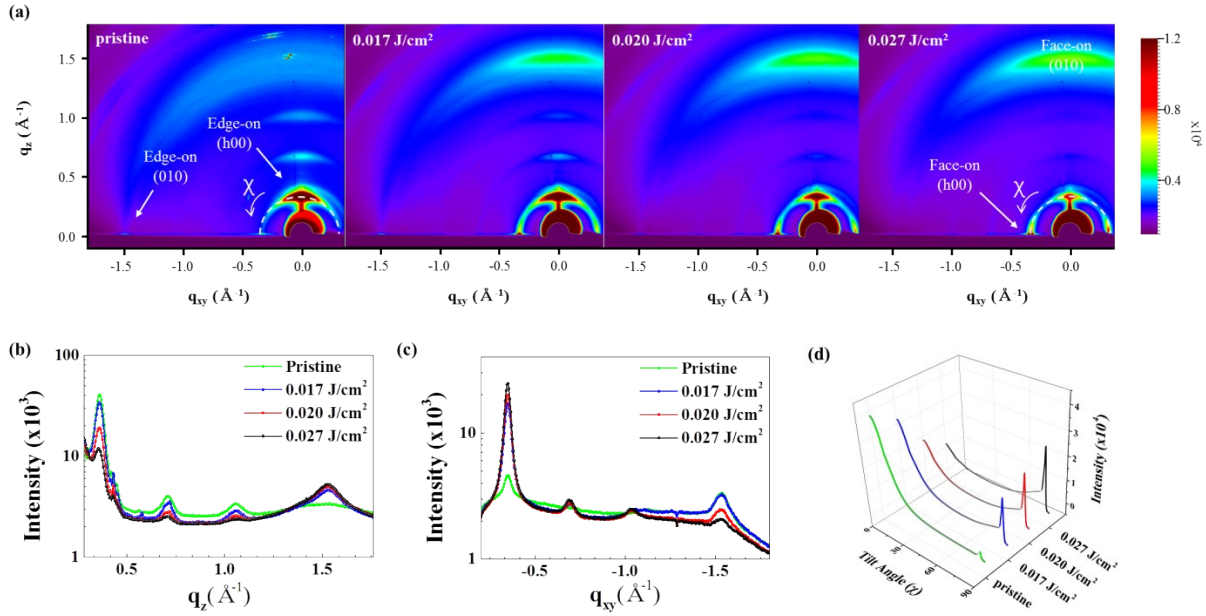


Figure S5. a) 2D GIWAXS images of the pristine and laser-irradiated P3HT thin films of 65 nm thickness. b) Vertical (out-of-plane) line cuts from the 2D images, and c) horizontal (in-plane) line cuts from the 2D images. d) Circular line cuts of (100) peaks.

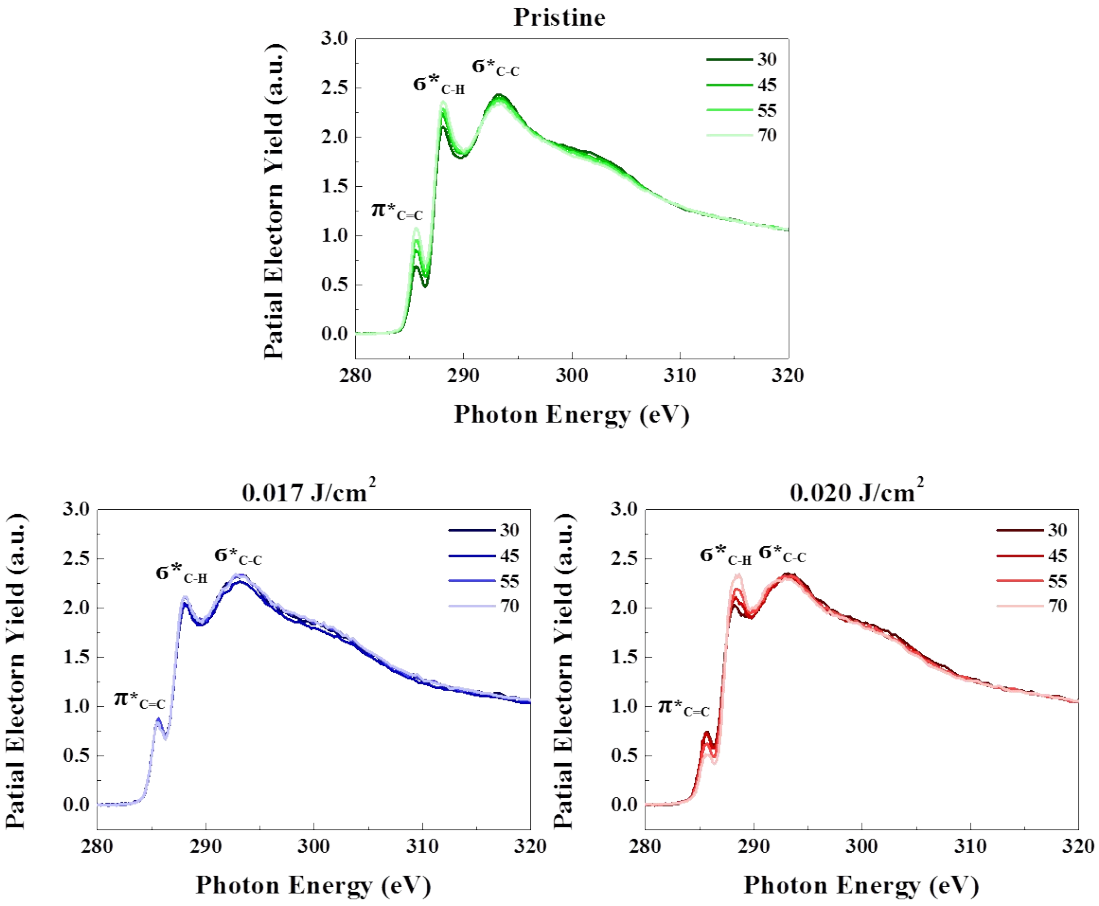


Figure S6. a-c) NEXAFS PEY spectra of the pristine and laser-irradiated P3HT thin films measured at various X-ray incidence angles (30°, 45°, 55°, 70°).