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## High-speed vacuum ultraviolet imaging system for edge plasma in EAST

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A high-speed vacuum ultraviolet imaging (VUVI) system for edge plasma studies is being developed on the Experimental Advanced Superconducting Tokamak (EAST). Its key optics is composed of an inverse type of Schwarzschild telescope made of a set of Mo/Si multilayer mirrors, a micro-channel plate (MCP) equipped with a P47 phosphor screen and a high-speed camera with CMOS sensors. In order to remove the contribution from low-energy photons, a Zr filter is installed in front of the MCP detector. With this optics, VUV photons with a wavelength of 13.5 nm, which mainly come from the line emission from intrinsic carbon (C vi: n = 4-2 transition) or the Ly- $\alpha$  line emission from injected Li iii on the EAST, can be selectively measured two-dimensionally with both high temporal and spatial resolutions. Interesting events in the edge plasma, such as ELMs, dust etc, have been captured by this system. Their dynamics have been studied using the imaging data [1][2]. Based on the success of the VUVI system, a multi-spectral extreme ultraviolet imaging (MEUVI) system is being developed to measure the Te profile in the edge region [3]. Line emissions from six wavelengths are measured simultaneously in such a single telescope, in which each pair of primary and secondary mirrors are projected nearly 1/6 sector in the arc vector direction. Electron temperature can be measured by using this optics. We will present the experimental results obtained using the high-speed VUVI system and recent progress of the MEUVI system.

[1] T.F. Ming, T. F. Tang, Q.Q. Shi et al 2022 Nucl. Fusion 62 126039

[2] S.W. Hou, T.F. Ming, Q.Q. Shi, et al Plasma Sci. Technol. 25 (2023) 055101

[3] S.W. Hou, T.F. Ming, H.X. Si et al, Fusion Eng. Des. 208 (2024) 114681

## Keyword-1

Imaging

## Keyword-2

ELM filament

## Keyword-3

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