

Fast cameras related bibliography

Abbasi et al.: Plasma diagnostics using fast cameras at the GOLEM tokamak

Abbasi-2023-FUSENGDES23

S. Abbasi et al. "Plasma diagnostics using fast cameras at the GOLEM tokamak". In: *Fusion Engineering and Design* 193 (2023), p. 113647. ISSN: 0920-3796. DOI: <https://doi.org/10.1016/j.fusengdes.2023.113647>. URL: <https://www.sciencedirect.com/science/article/pii/S0920379623002302>.

Abstract: Tomographic inversion of radiation determines spatial distribution of tokamak plasma radiation sources using line integrated plasma projections data. For measurements of the projections, fast visible radiation matrix cameras became broadly applied on tokamaks in recent past. These novel cameras opened new possibilities in high temperature plasma studies. The GOLEM tokamak of the Czech Technical University in Prague strives to implement up-to-date diagnostics with enhanced temporal and spatial resolution. Therefore, a novel diagnostic system of two crossed monochrome cameras Photron FASTCAM MINI UX50 was integrated into the GOLEM diagnostics. The proposed contribution will detail their novel port mounts (vertical and horizontal) at the GOLEM tokamak which have been designed so that additional optical measurements of the plasma core (e.g. plasma spectroscopy) is possible. As the main purpose of this study, we shall focus in particular on the frame rate potential which is high enough to make detection and observation of highly transient phenomena in the GOLEM plasmas possible. Progress in solving specific challenges of the ill-conditioned tomographic inversion via the algorithm optimization and testing for the GOLEM tokamak will be presented together with the first tomographic results.

Odstrcil et al.: Low cost alternative of high speed visible light camera for tokamak experiments

Odstrcil-2012-RSI

T. Odstrcil et al. "Low cost alternative of high speed visible light camera for tokamak experiments". In: *Review of Scientific Instruments* 83.10, 10E505 (2012). DOI: 10.1063/1.4731003. URL: <http://scitation.aip.org/content/aip/journal/rsi/83/10/10.1063/1.4731003>.

Abstract: We present design, analysis, and performance evaluation of a new, low cost and high speed visible-light camera diagnostic system for tokamak experiments. The system is based on the camera Casio EX-F1, with the overall price of approximately a thousand USD. The achieved temporal resolution is up to 40 kHz. This new diagnostic was successfully implemented and tested at the university tokamak GOLEM ($R = 0.4$ m, $a = 0.085$ m, $BT \leq 0.5$ T, $I_p \leq 4$ kA). One possible application of this new diagnostic at GOLEM is discussed in detail. This application is tomographic reconstruction for estimation of plasma position and emissivity.