

Abstract Submitted
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Magnetic Diagnosis Upgrade and Analysis for MHD Instabilities on the J-TEXT¹ DAOJING GUO, QIMING HU, GE ZHUANG, NENGCHAO WANG, YONGHUA DING, YUEJIN TANG, Huazhong University of Science Technology, QINGQUAN YU, Max-Planck-Institut für Plasmaphysik, HUAZHONG UNIVERSITY OF SCIENCE TECHNOLOGY TEAM, MAX-PLANCK-INSTITUT FR PLASMAPHYSIK COLLABORATION — The magnetic diagnostic system on the J-TEXT tokamak has been upgraded to measure the magnetohydrodynamic (MHD) instabilities with diverse bands of frequencies. 12 saddle loop probes and 73 Mirnov probes are newly developed. The fabrication and installment of the new probes are elaborately designed, in consideration of higher spatial resolution and better amplitude-frequency characteristic. In this case, the probes utilize two kinds of novel fabrication craft, one of which is low temperature co-fired ceramics (LTCC), the other is flexible printed circuit (FPC). A great deal of experiments on the J-TEXT have validated the stability of the new system. Some typical discharges observed by the new diagnostic system are reviewed. In order to extract useful information from raw signals, several efficient signal processing methods are reviewed. An analytical model based on lumped eddy current circuits is used to compensate equilibrium flux and the corresponding eddy current fluxes, a visualization processing based on singular value decomposition (SVD) and cross-power spectrum are applied to detect the mode number.

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