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14.36 Advancements of quasi-optical system for Electron Cyclotron Emission Imaging diagnostic on J-TEXT tokamak

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The new electron cyclotron emission imaging (ECEI) system is being developed and set up on J-TEXT tokamak. The system includes two separate dual dipole antenna arrays. Each array contains 16(vertical direction) x 8(radial direction) = 128 channels. The quasi-optical system consists of two parts: the imaging optics for plasma imaging and the local oscillator optics for mixers driving. For the updated demands, some modification and progress are accomplished on the imaging optics subsystem. The field curvature of focal plane is limited to 4mm.The vertical zoom factor is 1.15-1.95, corresponding to the vertical coverage from 23.9 cm to 40.2 cm. And there will be a possibility to extend the vertical channels from 16 to 20 for the next step. A new local oscillator optics subsystem is designed as well, which is operated to guarantee the uniform driving requirement of all antenna channels, especially for the edge ones. For the wide range (from 1.2T to 2.3T) of typical toroidal magnetic field on J-TEXT, the focus plane needs to be adjusted in different experiment. So a joint remote control unit is employed for both imaging optics and local oscillator optics subsystems. The latest optical testing results will also be introduced and compared with simulation results.

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