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FTP/P1-16: Progress in the Development of the ECRF System for JT-60SA

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The electron cyclotron range of frequency (ECRF) system for JT-60SA is composed of 9 gyrotrons with the total injection power of 7 MW and the pulse duration of 100 s, transmission line with the total length of ~80 m, and linear-motion launchers. This paper comprehensively presents recent progress in the development of the ECRF system. Major results are (1) the extension of gyrotron output energy (60 MJ) by a factor of ~2 compared with the results presented in the last IAEA FEC through the installation of a new 60.3 mm diameter transmission line, (2) successful tests on optical and mechanical characteristics of a linear-motion launcher, which enables >1 MW, 100 s injection with a wide coverage of toroidal (typically -15 deg. to +15 deg.) and poloidal (-40 deg. to +20 deg. with respect to the horizontal plane) directions, (3) the development of a dual-frequency gyrotron which can output 110 GHz and 138 GHz ECRF at >1 MW for 100 s for heating (ECH) and current drive (ECCD) typically around the half minor radius at the full toroidal magnetic field of 2.3 T in JT-60SA.

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