

HTPD 2018



Contribution ID : 130

Type : not specified

12.55 Design and application of terahertz solid state source based multi-channel interferometer on KTX

Wednesday, 18 April 2018 20:31 (120)

Terahertz solid state sources have been successfully applied on an one chord interferometer system on Keda Torus eXperiment (KTX), a reversed field pinch machine. For exploring the capacity of microwave source for electron density profile diagnosis of magnetic confinement plasma. The one chord interferometer system has been upgraded to a multi-channel system using the same solid state sources. The optical configuration has been optimized using carefully designed light path and optical elements. The area of the platform holding the whole system including the sources and mixers has been set 3m×3m. The beam width across plasma area has been improved to less than 21mm, and the power has been uniformly distributed at all receivers for seven channels. The system has been installed on KTX machine and the results show that the maximum signal strength can reach about 0.6mV and the phase noise of the intermediate frequency is about 0.0674pi, corresponding to about 0.1% of the integral electron density amplitude. The radial profiles of electron density on KTX in different discharge configurations have been reconstructed based on Abel inversion.

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Session Classification : Session #12, Wednesday Night Poster Session