

HIGH-POWER MILLIMETRE-WAVE COMPONENTS COMBINING QUASI-OPTICS WITH OVERSIZED RECTANGULAR CORRUGATED WAVEGUIDE.

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The use of an oversized rectangular corrugated waveguide has been considered so far mainly in connection with the possibility to have an output beam that can be remotely steered at the waveguide input. An important application is the Remote Steering concept of the Upper ECRH launcher foreseen for neoclassical tearing modes stabilization in ITER[1].

New concepts for its application in different situations are being studied.

One is the narrow-band diplexer that is proposed in order to switch the millimetre-wave power between two launchers synchronously with the island rotation [2]. The paper presents a version that can be realized as a resonator based on half-length of the oversized rectangular corrugated waveguide for Remote Steering (length $4D^2/\lambda$), in combination with mirrors.

Advantages of this solution are the smaller size with respect to other diplexers using the squared corrugated waveguides and the possibility to tune it on the gyrotron frequency. A drawback is the need of accurate tuning and the narrowness of the band needed for a stable power splitting in the two channels. The same solution can be used, in principle, with two inputs and two outputs that are independently usable to split and/or combine the power of two gyrotrons, as far as the frequency of them can be changed with sufficient control. This allows to combine (continuous or modulated) power of different gyrotrons into the same line. A discussion of the diplexer/combiner in this configuration is presented, together with calculations.

References

- [1] A.G.A. Verhoeven et al., Remote Steering Design of the ITER ECRH Upper-Port Launcher, This Conference.
- [2] W. Kasparek et al., Fast Switching of High-Power Millimetrewaves between two Launchers: Concepts, Numerical Investigations and First Experiments, This conference.