EFFECTIVE EXCITATION OF QUASI-OPTICAL RESONATOR IN MILLIMETER WAVE*

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ABSTRACT

It is described effective excitation of quasi-optical resonator (Q. O. R.) in millimeter wave (M. M. W.) in this article in which some useful results are obtained.

KEY WORDS

optimal excitation, Q. O. R, M. M. W.

INTRODUCTION

Various power combining techniques have been investigated over the past two decade. At centimeter wave and long M. M. W.

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band, the conventional approach to power combining of solid state source (S. S. S) involves placing a number of the S. S. S in waveguide cavity with tuning circuits for each source. However, this approach becomes impractical and difficult to build at short M. M. W and sub-M. M. W band. Recently, it was suggested that the outputs of a great number of S. S. S could be combined by placing the sources in a Q. O. R. The approach avoids increased ohmic losses in the waveguide walls and eliminated the need for individual tuning circuits for each devices. At present, the Q. O power combining technique for S. S. S. is more and more showing its merits and arising great interests of domestic and oversea scholars. It has been developed rapidly with great efforts in many countries of world, such as USA[1], Ukraine[2], Japan, and at China some units have researched in this field since 1986 and obtained some significant results[3–4].

![Diagram of waves](image1.png)

**Fig. 1** Fundamental mode.

![Diagram of waves](image2.png)

**Fig. 2** Some modes of field.

**ANALYSIS AND DESIGN**

For simplicity let us have infinite strip-mirror open resonator. This open resonator has only two coordinates x, z, seeing Fig. 1.