197
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Title:A review on the applications of high power, high frequency microwave source: Gyrotron
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Abstract:The gyro oscillators or simply gyrotrons are used in a variety of applications where high electromagnetic power is required at millimeter/submillimeter wave frequencies. The research on the gyrotron microwave tube was initiated by the demand of high power, high frequency electromagnetic wave source in the magnetically confined plasma fusion application. Since the initial phase of gyrotron development, new thrust areas have been explored by the several research groups. The gyrotron shows several unique advantages as a high power source compare to the other millimeter/submillimeter wave sources either semiconductor based devices or vacuum based tube devices. At present gyrotron is used successfully in the field of plasma heating, plasma diagnosis, medical spectroscopy, material processing, whether monitoring etc. discussed in detail in this article. Several new fields of technology like security, metal joining, planetary defense etc. are under exploration for the futuristic use of gyrotron. In this review article, the applications of gyrotron, various issues remained in the further modification of the device, global scenario of the gyrotron development are discussed in detail.
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