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Title:Analysis and design of ring-resonator integrated hemi-elliptical lens antenna at terahertz frequency
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Abstract:In this paper, a novel lens integrated ring-resonator microstrip antenna is analyzed and simulated at 600 GHz. A mathematical model to compute the directivity of this kind of the antenna has been developed and the directivity of the antenna has been computed which is 18 dBi. The proposed model has been simulated by using CST Microwave Studio a commercially available simulator based on finite integral technique and similar result has been obtained. Further, the directivity of the antenna has also been computed by using the techniques reported in the literature and in this case also we have obtained the similar result. Later, a probe-fed patch integrated lens antenna has also been investigated to validate the correctness of the numerical method. To find the potential advantages of this kind of the structure, the - 10 dB impedance bandwidth of the antenna has been compared to a lens-integrated probe-fed microstrip patch antenna and a significant enhancement in the bandwidth has been observed. 
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