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Title:High-order photonic bandgap reflex klystron using carbon nanotube multi-beam cathode
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Abstract:The oscillation of a high-order mode TM<inf>330</inf> is observed in a photonic bandgap multi-beam reflex klystron using nine electron beams generated from a carbon nanotube cathode. One side of a conventional metal cavity was replaced with a dielectric photonic crystal lattice to form a hybrid photonic-bandgap resonator, which uses lattice bandgap effects, resulting in a more uniform field of a higher-order mode, as well as the exclusion of some conventional-cavity-type modes, thereby reducing mode competition. The high-order and multi-beam concepts would be applicable to a terahertz radiation source when the device is micromachined. © 2012 The Institution of Engineering and Technology.
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