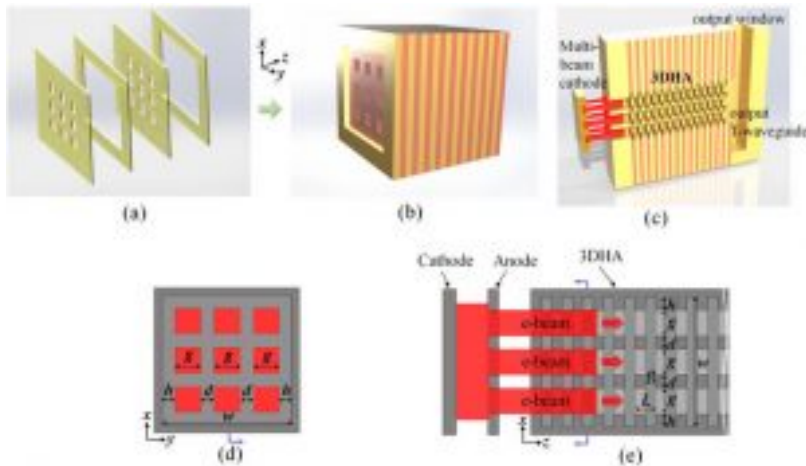


# Coherent Terahertz Radiation from Multiple Electron Beams Excitation within a Plasmonic Crystal-like Structure



Coherent terahertz radiation from multiple electron beams excitation within a plasmonic crystal-like structure (a three-dimensional holes array) which is composed of multiple stacked layers with  $3 \times 3$  subwavelength holes array has been proposed in this paper. It has been found that in the structure the electromagnetic fields in each hole can be coupled with one another to construct a composite mode with strong field intensity. Therefore, the multiple electron beams injection can excite and efficiently interact with such mode. Meanwhile, the coupling among the electron beams is taken place during the interaction so that a very strong coherent terahertz radiation with high electron conversion efficiency can be generated. Furthermore, due to the coupling, the starting current density of this mechanism is much lower than that of traditional electron beam-driven terahertz sources. This multi-beam radiation system may provide a favorable way to combine photonics structure with electronics excitation to generate middle, high power terahertz radiation.

**Source:** <http://www.nature.com/articles/srep41116>

**Related paper:** Yaxin Zhang et al., Coherent Terahertz Radiation from Multiple Electron Beams Excitation within a Plasmonic Crystal-like structure, *Scientific Reports* **7**, Article number: 41116 (2017).