

Hyperbolic Medium and Graphene: Towards Realization of Compact Vacuum Electron Devices

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THz, a non-ionizing electromagnetic radiation, has a wide spectrum of applications ranging from medical to societal, communication to homeland security, etc. However, the lagging of compact, tunable and high-power THz source, has limited the major outreach of THz technology. In last two decades the convection electron beam driven THz source development has attracted attention among researchers for its high-power delivering capabilities. However, reduced transverse dimension of interaction structure, high operating voltage, and high-density electron beam confinement and transmission pose great challenges to realize those sources. In recent years, research on artificial material with circular, parabolic and hyperbolic dispersion has shown the possibility of opening up new avenues for development of compact, high power, tunable THz sources. In addition, research in graphene as a high current density emitter would also help to fabricate complete devices using planer fabrication process. A glimpse of work carried out on hyperbolic medium as an interaction structure for vacuum electron devices will be presented in this conference.

Invited talk