

TITLE: CVD-graphene plasmonic metasurfaces for terahertz optoelectronics

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100-WORD TEXT SUMMARY: Graphene plasmonics provides a powerful means to extend the reach of metasurface technology to the terahertz spectral range, with the distinct advantage of active tunability. However, most prior proposals of graphene THz plasmonic devices assume electrical characteristics that are not compatible with sufficiently large samples grown by chemical vapor deposition (CVD). Here we introduce a comprehensive design platform that can overcome this limitation, based on graphene nanoribbons combined with metallic antennas on a vertical cavity. With this configuration, we present a single device structure that can be electrically reconfigured to enable multiple wavefront-shaping functionalities, including tunable beam steering and focusing with variable numerical aperture. Applications of the same platform to THz light emission will also be discussed. These capabilities are promising for a significant impact in multiple THz technologies for sensing, imaging, and wireless communications.