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Title:Directional terahertz beams realized by depth-modulated metallic surface grating structures

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Abstract:We propose a subwavelength metal slit with surrounding depth-modulated surface grating structures to realize directional beams in the terahertz regime. The surface gratings consist of two sets of grooves of different depths. The shallow grooves are designed to support the spoof surface plasmons, and the deep grooves are utilized to diffract the terahertz surface wave into free space. Theoretical analysis and numerical simulations based on the finite element method confirm that various beaming effects including splitting, on-axis beaming, and off-axis beaming can be realized by controlling the distributions of the deep grooves.

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