



### 发光学应用及交叉前沿

#### 具有表面波完全极化禁带的平面特异材料的定向辐射效应

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摘要：从理论和实验上研究了镂有三角晶格小孔阵列的金属薄板表面波禁带行为，通过改变小孔直径以及其他几何参数，发现三角晶格是表面波完全极化禁带产生的原因。利用该表面波完全禁带实现了点源的定向辐射。通过测量放在该平板表面的偶极子天线辐射源的远场方向图，观测到在表面波完全禁带里面，远场方向图的E面和H面半高宽分别只有5.6°和6.2°。

关键词：特异材料 表面波完全极化禁带 定向辐射

本刊中

1. 对称性

(2):

#### Directive Emission Derived from A Meta-surface with Complete Bandgap of Surface Resonances

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Abstract: The complete bandgap of surface resonances on a metal plate perforated with a triangular array of air holes was theoretically and experimentally investigated. Parametric study of holes size implies that the triangular lattice is predominant to the formation of the complete bandgap. As a useful application, highly directive emission from a dipole antenna positioned near the meta-surface is observed at the lower band edge and at other frequencies inside the bandgap. It has a half power beamwidth of 5.6° in E-plane and 6.2° in H-plane, exhibiting a very high directivity.

Keywords: metamaterials surface resonance bandgap directive emission

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