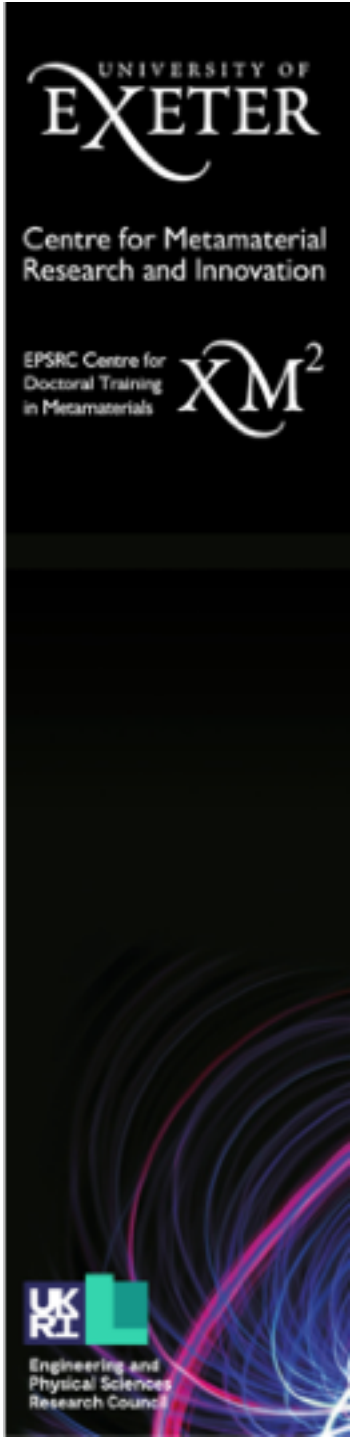
UNIVERSITY OF EXETER

Centre for Metamaterial Research and Innovation

EPSRC Centre for Doctoral Training in Metamaterials

XM²

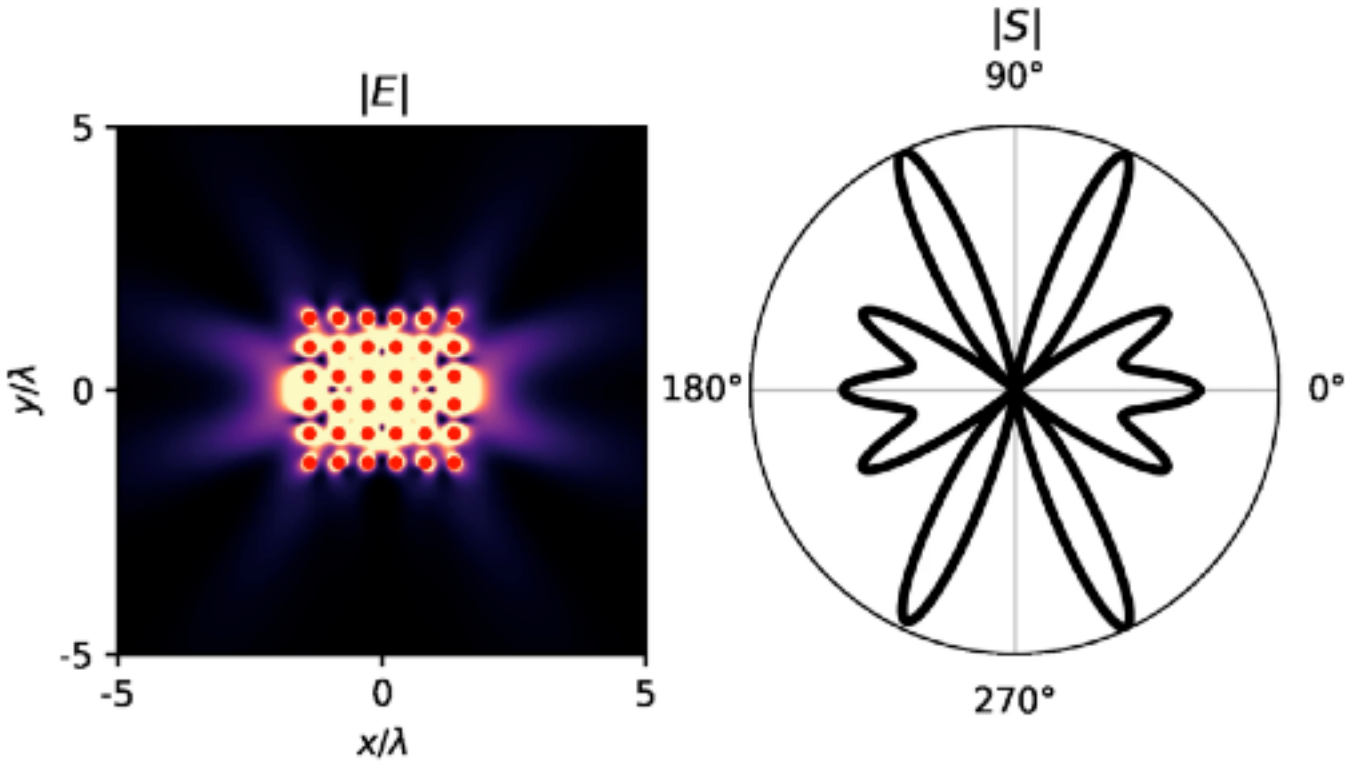


UKRI Engineering and Physical Sciences Research Council

www.metamaterials.center

# Directivity

10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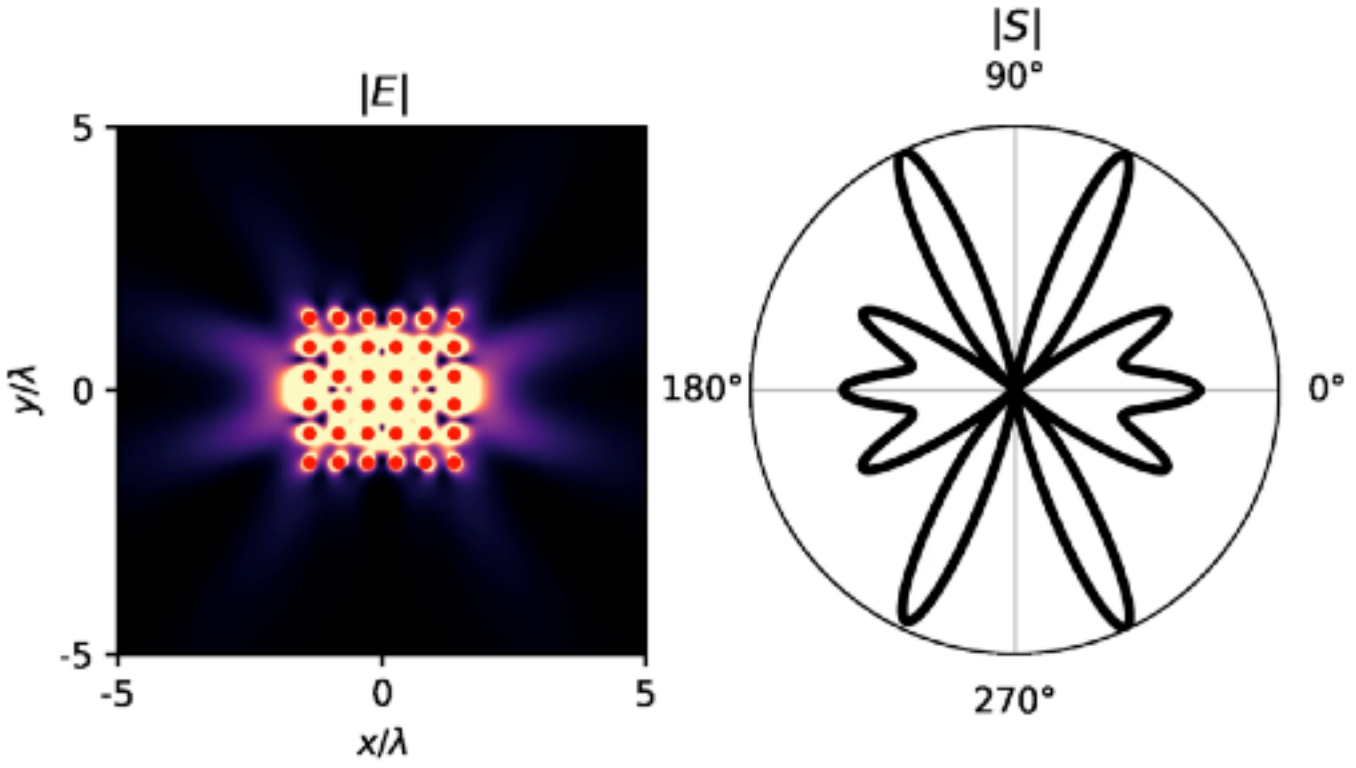
$$\delta P = \mathrm{Im}\left\{ \mathbf{p}^* \cdot \left[ \xi^2 \overleftrightarrow{\mathbf{G}}(\mathbf{r}_t, \mathbf{r}_n) \alpha_E \nabla \mathbf{E}(\mathbf{r}_n) + i\xi \nabla \times \overleftrightarrow{\mathbf{G}}(\mathbf{r}_t, \mathbf{r}_n) \alpha_H \nabla \mathbf{H}(\mathbf{r}_n) \right] \right\} \delta \boldsymbol{r}_n$$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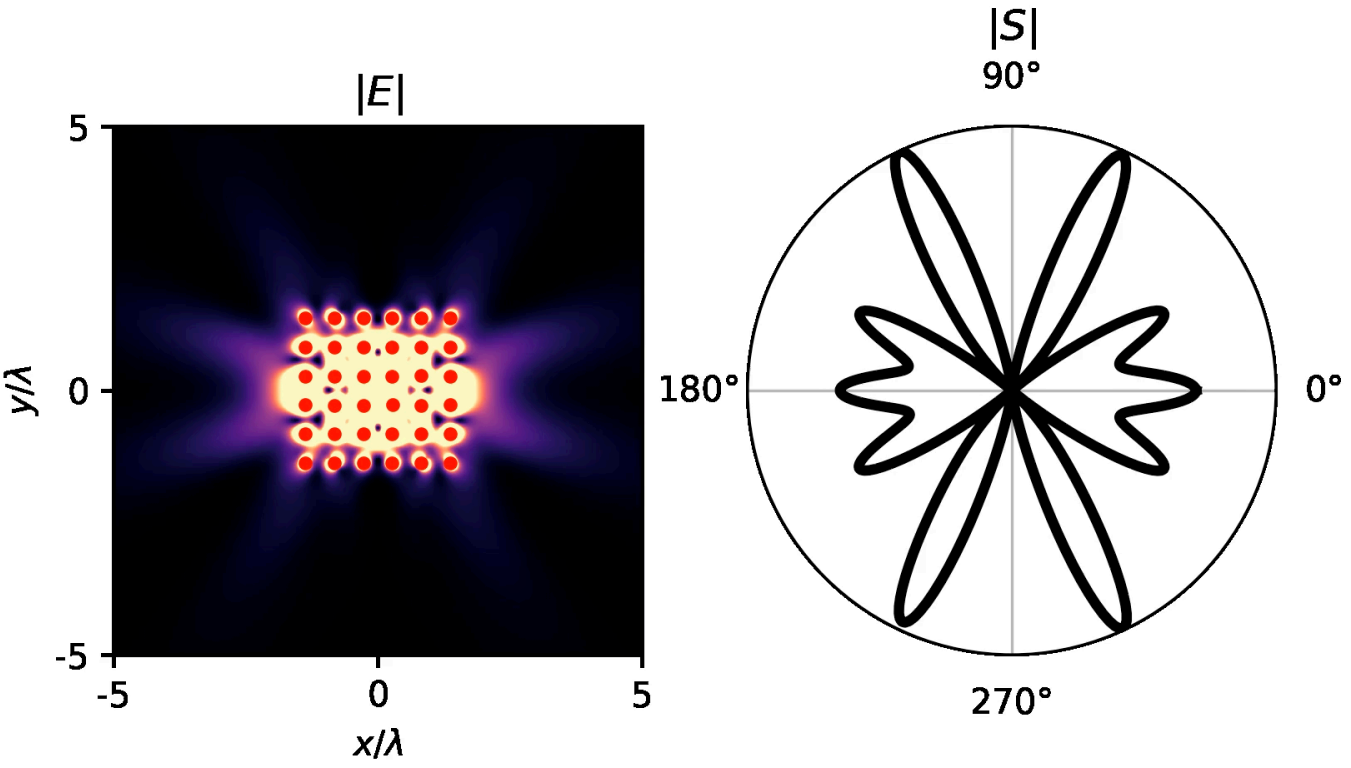
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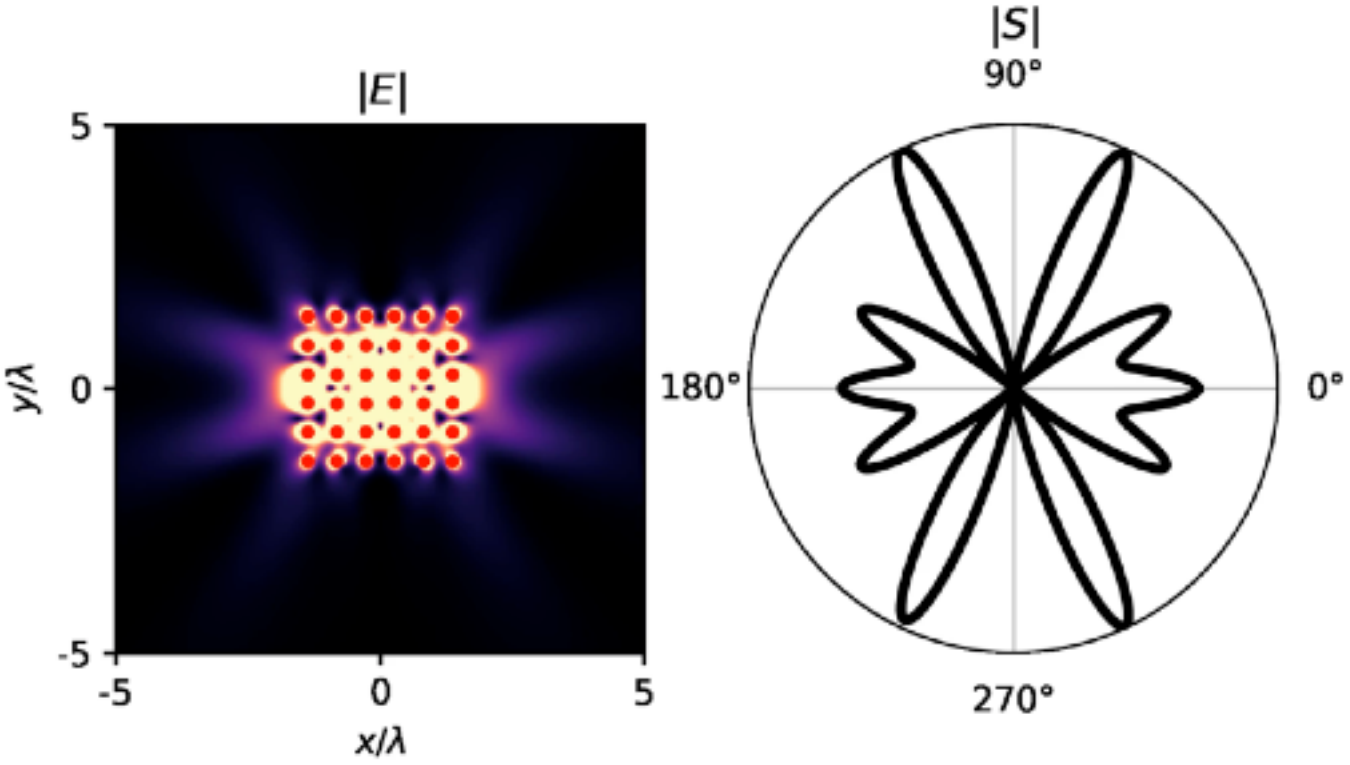
# Directivity

$$\delta P = \mathrm{Im}\left\{ \mathbf{p}^* \cdot \left[ \xi^2 \overleftrightarrow{\mathbf{G}}(\mathbf{r}_t, \mathbf{r}_n)\alpha_E \nabla \mathbf{E}(\mathbf{r}_n) + i\xi \nabla \times \overleftrightarrow{\mathbf{G}}(\mathbf{r}_t, \mathbf{r}_n)\alpha_H \nabla \mathbf{H}(\mathbf{r}_n) \right] \right\} \delta \boldsymbol{r}_n$$



# Far-field Shaping

$$F = \frac{1}{\sqrt{\int d\theta |\boldsymbol{S}(\theta)|^2}\sqrt{\int d\theta \phi(\theta)^2}} \int d\theta |\boldsymbol{S}(\theta)| \phi(\theta)$$