

SPIE Photonics Europe 2018

Metamaterials

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Dielectric-Rod Gradient Metasurfaces Based on Matched Toroidal and Magnetic Dipole Resonances

O. Tsilipakos, A. C. Tasolamprou, Th. Koschny, M. Kafesaki,
E. N. Economou, C. M. Soukoulis

*Foundation for Research and Technology – Hellas (FORTH), Greece
Ames Laboratory and Iowa State University, USA*

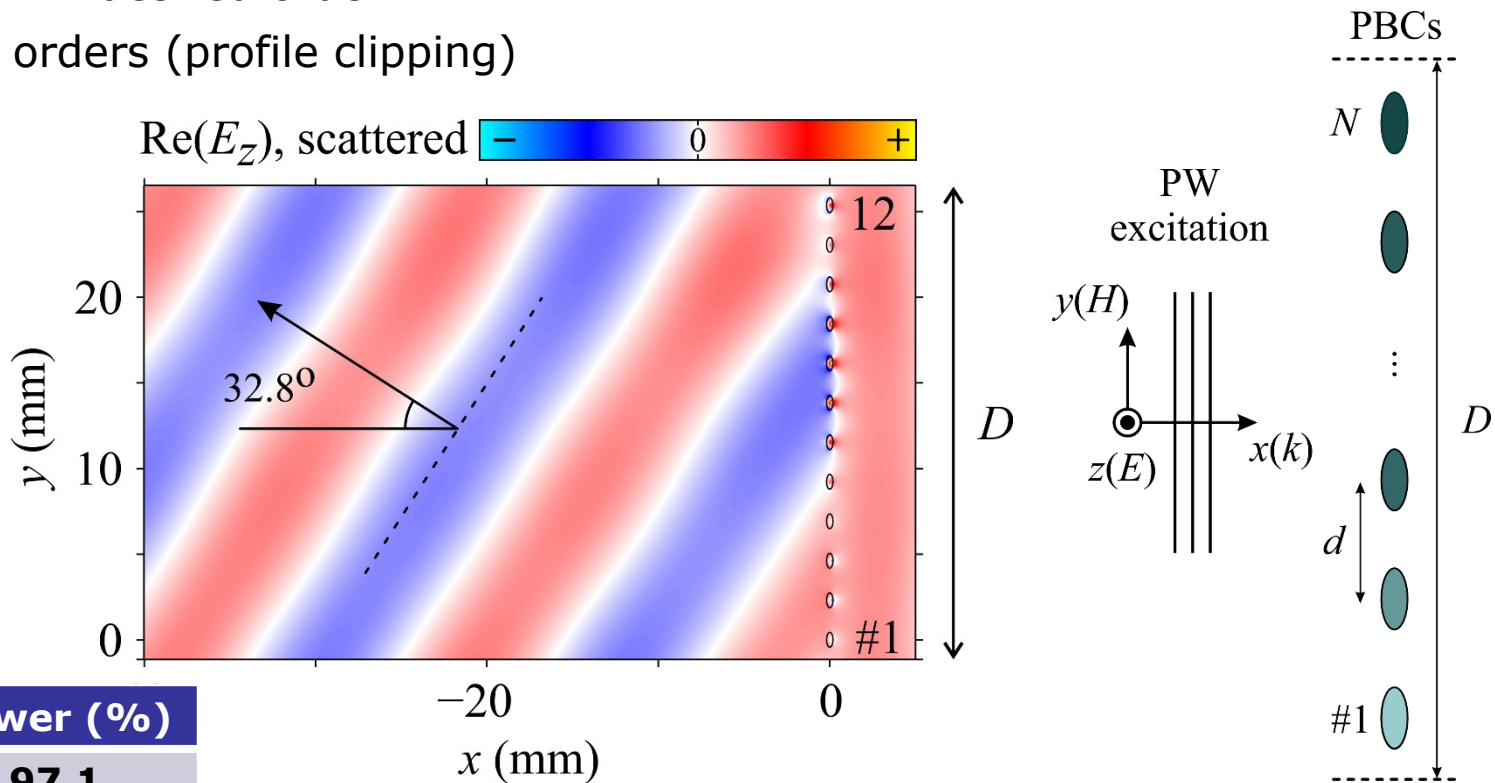
otsilipakos@iesl.forth.gr



Steering Metasurface ($N=12$, $\theta_r=32.8\text{deg}$, $\epsilon_r \pm 8\%$)

Performance

- ❑ **97%** reflection in desired order
- ❑ 0.8% in other orders (profile clipping)



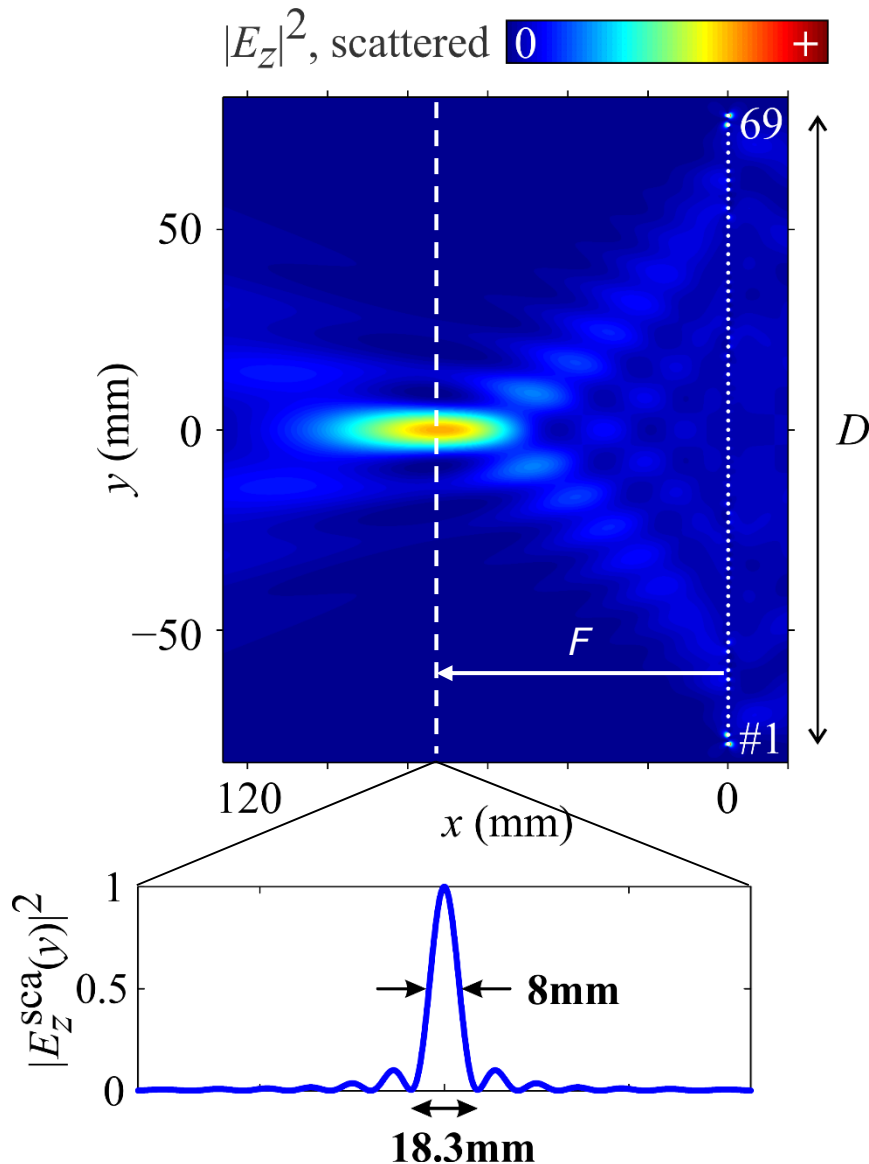
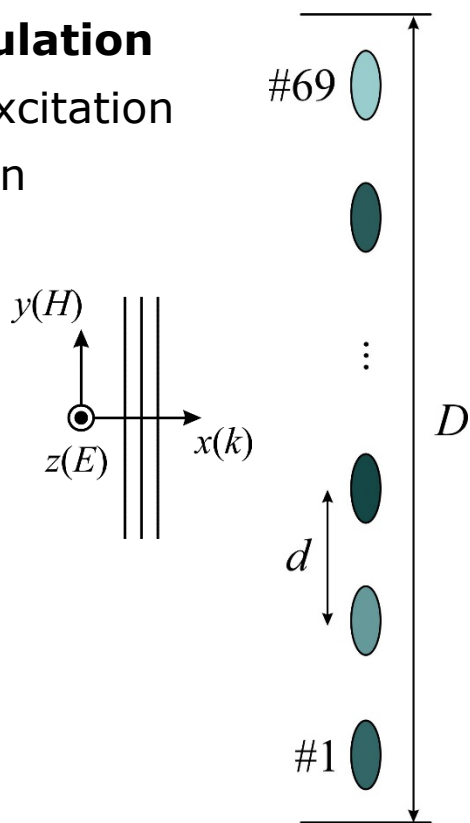
	Power (%)
Refl. $m=1$	97.1
Refl. rest	0.8
Transm.	1.2
Absorbed	1

	Power (%)	$\tan\delta=10^{-3}$	$\tan\delta=10^{-2}$
Refl. $m=1$	89.2	41.5	
Absorbed	9.4	55.2	

Focusing metasurface ($N=69$, $f=5\lambda_0$, $\epsilon_r \pm 8\%$)

Full-wave simulation

- Plane wave excitation
- TE polarization



Field distribution

- $F = 73.5\text{mm}$ (actual focal distance)
 - $f = 75\text{mm}$ (prescribed)

Thank you!

otsilipakos@iesl.forth.gr

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