

Description of Additional Supplementary Files

File name: Supplementary Movie 1

Description: Measured transverse intensity profiles of a vortex beam changing its topological charge value from 1 to -3 as it propagates away from the metasurface.

File name: Supplementary Movie 2

Description: Measured transverse intensity profiles of a vortex beam changing its topological charge value from 2 to -1 as it propagates away from the metasurface.

File name: Supplementary Movie 3

Description: Simulated spatial evolution of a vortex beam reducing its topological charge from 100 to 1 as a function of propagation distance.

File name: Supplementary Movie 4

Description: Simulated spatial evolution of a vortex beam reversing its topological charge from 50 to -50 as a function of propagation distance.