

## **Description of Additional Supplementary Files**

File Name: Supplementary Movie 1

Description: The reconfiguration of the 2D tessellation.

File Name: Supplementary Movie 2

Description: Decoupled motion of 3D unit.

File Name: Supplementary Movie 3

Description: Reconfiguration and experimental characterization of the transformable metamaterial.

File Name: Supplementary Movie 4

Description: Transformation process of the 3D metamaterial unit cell with 10 configurations.

File Name: Supplementary Movie 5

Description: Transformability validation of ten configurations via reconfiguration experiments.

File Name: Supplementary Movie 6

Description: 2D wave functions in the FE metamaterial sample.