Supplementary Information Text

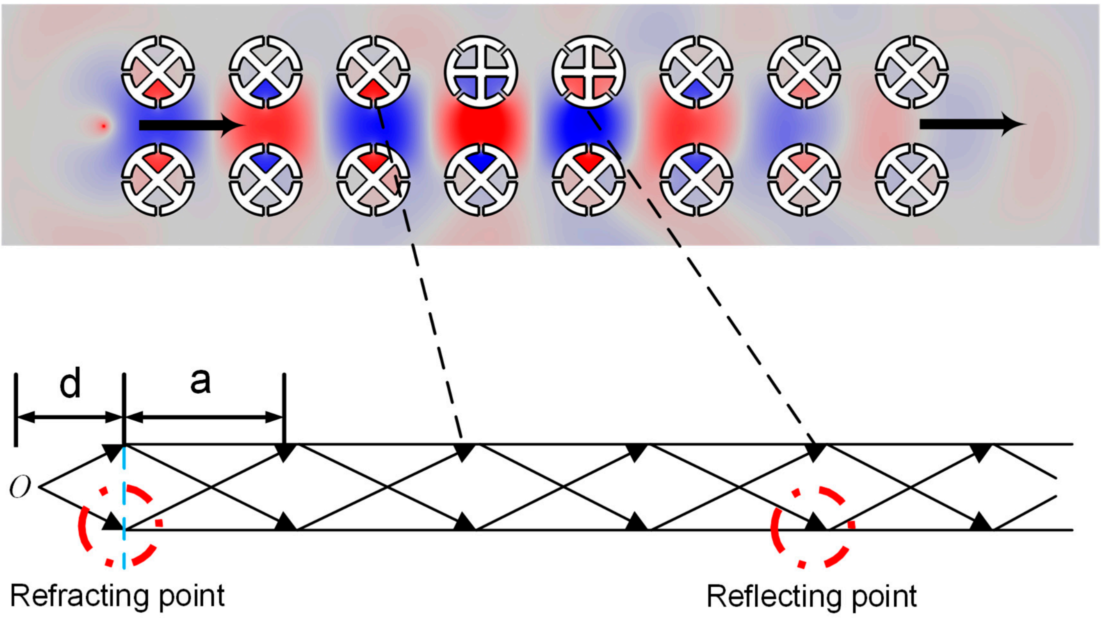

Figure S1. a A perfect lens formed by a virtually resonant tunnel, supported by Fabry－Pérot resonance. **b** Schematic of the lens. The effective refractive index is close to −1, which can be guaranteed when the spacing between point *O* and inlet d is equal to 1/2 *a* (lattice constant). In this mode, the red circles show that the resonators serve as stable reflecting points.

Amplitude comparisons. We compare the amplitudes of the vibrations at the 10 points in the metamaterial obtained from the simulation and experiments in Fig. S2. Good agreements can be obtained in Figs. S2a and S2c, both at the critical points (such as points 5 and 7 in Fig. S2c) and trends (such as points 4 to 7 in Fig. S2a). The agreements validate the bending and symmetrical splitting patterns of the "trapping mode" in the T-shaped water wave metamaterial. As for Fig. S2b, the asymmetrical splitting pattern can be observed to some extent. For example, after passing the T-intersection, the first detecting points 5 and 8 at the two vertical branches have the same level of vibration amplitudes and the last two detecting points (5, 6) and (9, 10) at the two branches suffer from severe dissipations compared to the numerical predictions. Poor agreements (only for points 8 to 10 and the trends for points 4 to 7) are obtained for the rectilinear transmission pattern in Fig. S2d. This is due to the fact that for the "following mode," the laser spots have to be reflected between the space of the two face-to-face resonators and thus the surface tension distorts the spots to a line shape. For the DIC technique, the line-shape spots affect the identification of the spot location and the detection accuracy.

In the experimental results, except for the "symmetrical splitting" in Fig. S2c, the vibration amplitudes corresponding to the detecting points 5, 6, 7 for other patterns indicate a significant dissipation after the water wave passes through the T-intersection from the left inlet of the metamaterial. On the contrary, at 5.2 Hz in Fig. S2c, the inlet is in the vertical branch. In this case, even after passing the intersection, the vibration amplitudes have comparable levels to those at points 5 and 7. Although in Fig. S2c, the wave propagation from the bottom inlet is supposed to be symmetrically bent to the two right and left horizontal branches, the slight reflections from the walls of the ripple tank and the practical different laser spots lead to imperfect symmetrical amplitude distributions in the metamaterial. In other words, in the experiments, not all the laser spots can be precisely located at the center of the measured position due to the individual variations of the laser spots. It should be noted that for the "rectilinear transmission" pattern of the "following mode" in Fig. S2d, the amplitudes of the water wave at the points in front of the T-intersection are rather large due to the high reflection from the face-to-face resonators.

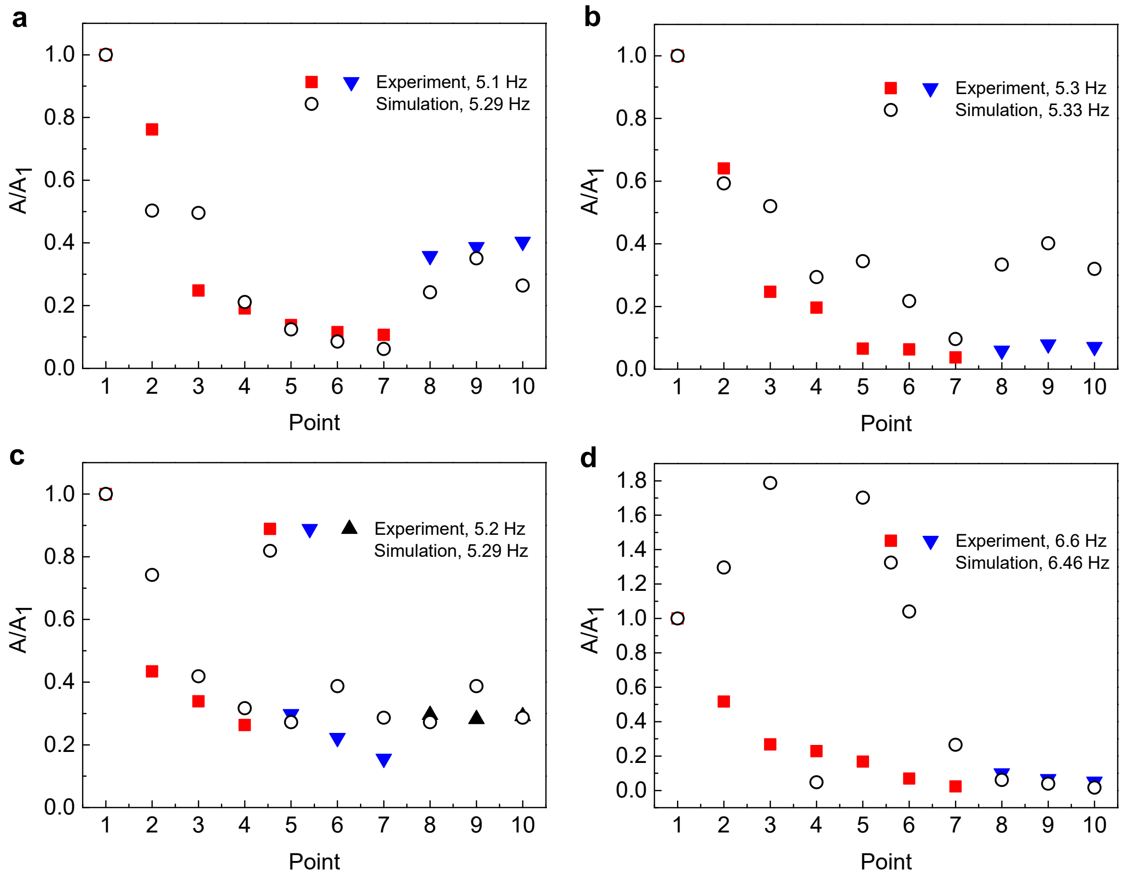

Figure S2. Amplitude comparisons. Experimental and numerical demonstrations of vibration amplitute of corresponding points in the T-shaped water wave metamaterial. **a** Bending. **b** Asymmetrical splitting. **c** Symmetrical splitting. **d** Rectilinear transmission.

Movie S1 (separate file). Movie S1_a 5.1 Hz.

Movie S2 (separate file). Movie S2_b 5.3 Hz.

Movie S3 (separate file). Movie S3_c 5.2 Hz.

Movie S4 (separate file). Movie S4_d 6.6 Hz.