Supplemental Document

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Topological phase transition in an all-optical exciton-polariton lattice: supplement

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In Fig. S1, we present the measured values of the p-band spectral gap as a function of the lattice spacing ratio d_D/d_A. The gap was extracted by fitting the spectrum at the centre of the chain with Lorentzian lines. We observe different values of the bandgap with respect to the similar deformation in diagonal (D) and antidiagonal (A) directions. This is because the sample energy gradient is aligned closer to the antidiagonal direction, which makes the tunneling amplitude t_A less sensitive to the variation of d_A.

Fig. S2 presents the experimental tomography images of the bonding and anti-bonding p-bands with the measured topological edge state for the modified chain of topological dimerisation $d_D/d_A = 1.25$, as discussed in the main text. Lower panel of Fig. S3(d-f) presents the corresponding theoretical simulations.

Fig. S3 presents the experimental tomography images of the bonding and anti-bonding p-bands of the modified chain of trivial dimerisation $d_D/d_A = 0.8$, discussed in the main text. Spectral cut at the centre of the gap is presented in Fig. S3(b), showing no signatures of localization at the edge. Lower panel of Fig. S3(d-f) presents the corresponding theoretical simulations.

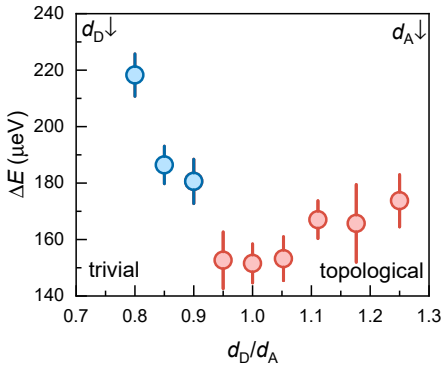

Fig. S1. Measurement of the p-bandgap. Values of the extracted bulk bandgap as a function of the lattice constant ratio d_D/d_A. Blue circles represent the bandgap values for the trivial configurations (absence of the topological edge modes) and red circles represent bandgap values in the topological regime.

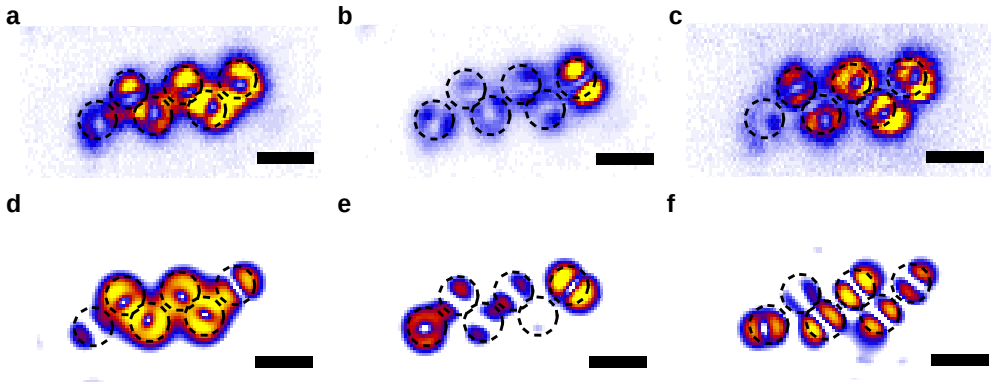

Fig. S2. Exciton-polariton density distribution in the modified $N = 6$ chain with $d_D/d_A = 1.25$. a-c, Experimental spectral tomography images corresponding to the energies (**a**) at the lower (bonding) p-band, (**b**) of the topological edge state inside the gap, and (**c**) at the upper (anti-bonding) p-band. **d-f**, Results of theoretical simulations of the nonlinear, open-dissipative model [see Methods, Eq. (4)] corresponding to the cases in (**a-c**). The scale bar is indicates 10 μm.

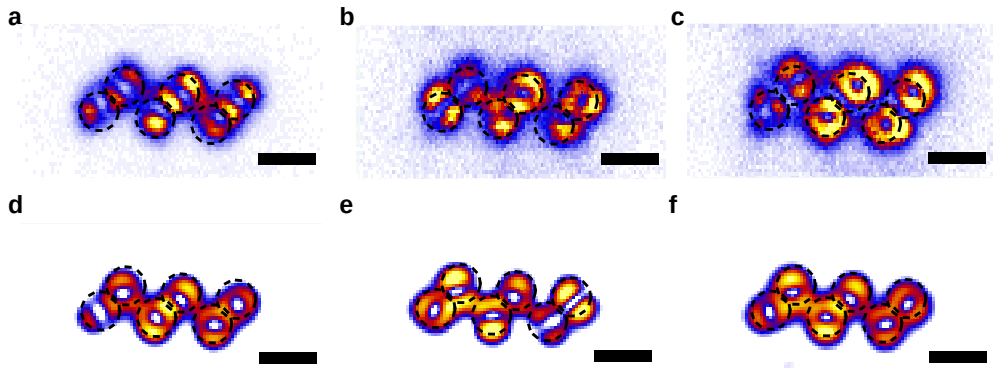

Fig. S3. Exciton-polariton density distribution in the modified $N = 6$ chain with $d_D/d_A = 0.8$. a-c, Experimental spectral tomography images corresponding to the energies (**a**) at the lower (bonding) p-band, (**b**) inside the p-band gap, and (**c**) at the upper (anti-bonding) p-band. **d-f**, Results of theoretical simulations of the nonlinear, open-dissipative model [see Methods, Eq. (4)] corresponding to the cases in (**a-c**). The scale bar is indicates 10 μm.