Supplementary Information for
Programmable high-dimensional Hamiltonian in a photonic waveguide array

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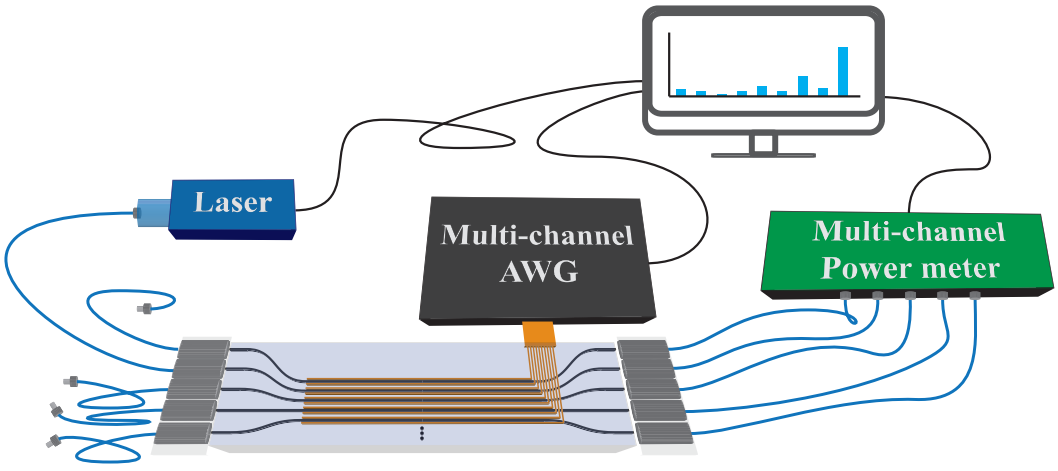
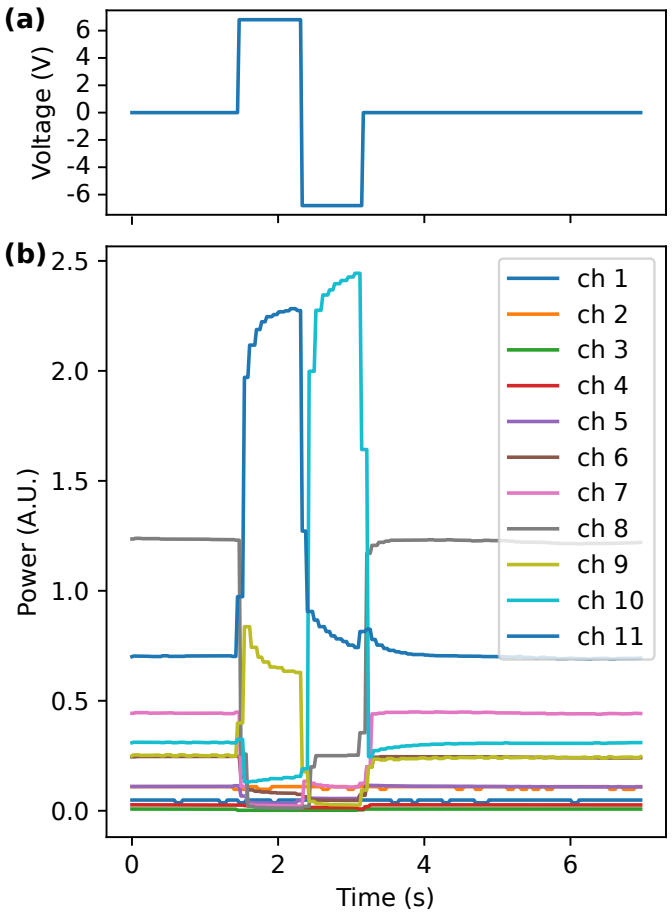
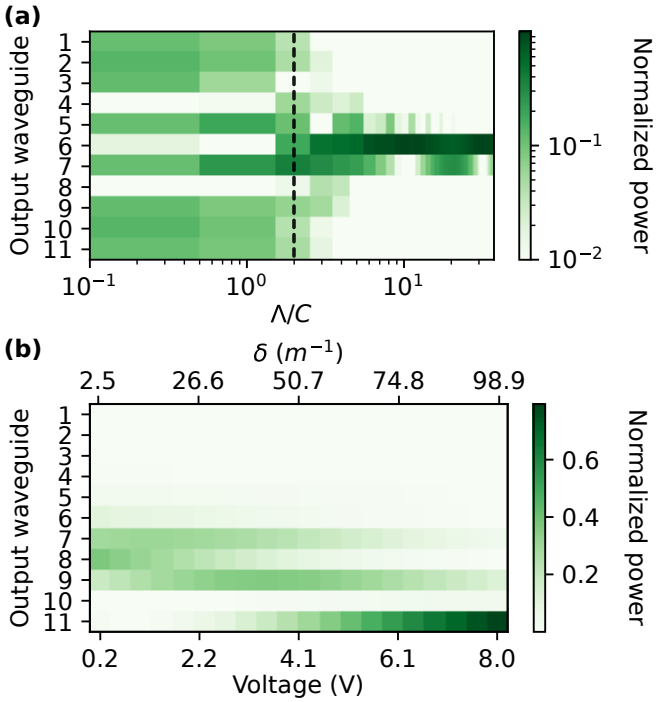
SUPPLEMENTARY FIGURES



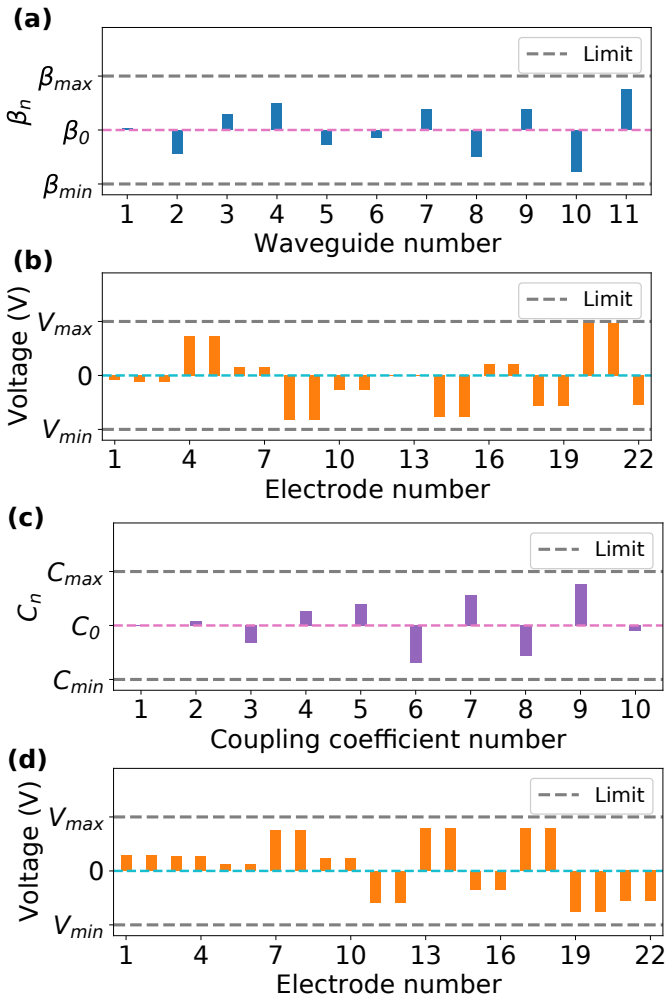
Supplementary Fig 1: Schematic of the setup. Two fiber arrays are coupled to the chip as input and output. An 808 nm polarized laser is connected to the input fiber array. Multi-channel arbitrary waveform generators are connected to the on-chip electrodes to generate control pulses. A multi-channel power meter is used to measure the chip output.



Supplementary Fig 2: Chip response example of SSH experiment (V=6.7 V) (a) The 1.66 s long 6.7 V non-biased square pulses from one of the AWG channels.(b) Output power measurement of SSH experiment with the pulsing shown in (a), following the pattern shown in Fig 3 (b).



Supplementary Fig 3: Simulations of the voltage-controlled output distribution. (a) Simulation of implementation of Aubry-André model with the device. (b) Simulation of implementation of SSH model with the device.



Supplementary Fig 4: Hamiltonian and corresponding voltage setting for Anderson localization experiments. (a) Propagation constants of each waveguide are randomly distributed within a range. (b) We paired every two electrodes between waveguides and applied pulses on all electrodes with random voltage amplitudes in a range. (c) Coupling constants between waveguides are randomly distributed within a range. (d) We paired every two electrodes on the top of each waveguide and applied pulses on all electrodes with random voltage amplitudes in a range.