Data Set for Topological Funneling of Light

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1 General Information

Dataset title	Data Set for Topological Funneling of Light
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Type	Measurements
Keywords	time multiplexed light walk, skin effect
Language	English
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2 Description

This document serves as a guideline for the data repository of the publication [1]. The guideline concerns the acquisition and processing of measurement data as well as structural information about the deposited files.

3 Data Acquisition

For each data set, a time-resolved measurement of pulse intensities with a DET01CFC photodiode has been performed in the shorter fiber loop. The output voltages of the photodiode are amplified with a logarithmic amplifier FEMTO HLVA-100 and afterwards sampled with an RTO1104 oscilloscope. The respective files are listed under "Raw Oscilloscope Data". With the characteristic time scales dt and T of the fiber loop arrangement it's possible to map the sampled voltage signal onto a discrete two-dimensional grid (m,n), which contains the intensities for the respective propagation steps m and lattice position n. For each propagation step, the intensities are normalized to the maximum intensity of the respective step. This improves the visibility of the localization, without biasing the physical data with respect to the non-Hermitian skin effect. For measurements, which feature a non-Hermitian modulation but no additional phase modulation, an additional noise measurement without input signal is performed and afterwards subtracted from the measurement with input signal. The processed data has been used for the figures in publication [1] and the corresponding files are listed under "Mapped Figure Data".

4 File Format

The data is provided in an ASCII format file, using the delimiter (,) to separate array elements. For example, individual data files can be read out with MATLAB via the command load(filename).

5 Archive Structure

Raw Oscilloscope Data

Filename	Description
RawDataFig3C	Vector of time-resolved photodiode voltages for Fig. 3C
RawDataFig3D	Vector of time-resolved photodiode voltages for Fig. 3D
RawDataFig3E	Vector of time-resolved photodiode voltages for Fig. 3E
RawNoiseFig3F	Time-resolved photodiode voltages for Fig. 3F without lattice excitation
RawDataFig3G	Vector of time-resolved photodiode voltages for Fig. 3G
RawNoiseFig3G	Time-resolved photodiode voltages for Fig. 3G without lattice excitation
RawDataFig3H	Vector of time-resolved photodiode voltages for Fig. 3H
RawNoiseFig3H	Time-resolved photodiode voltages for Fig. 3H without lattice excitation
RawDataFig4A	Vector of time-resolved photodiode voltages for Fig. 4A
RawNoiseFig4A	Time-resolved photodiode voltages for Fig. 4A without lattice excitation
RawDataFig4B	Vector of time-resolved photodiode voltages for Fig. 4B
RawNoiseFig4B	Time-resolved photodiode voltages for Fig. 4B without lattice excitation
RawDataFig4C	Vector of time-resolved photodiode voltages for Fig. 4C
RawNoiseFig4C	Time-resolved photodiode voltages for Fig. 4C without lattice excitation

Mapped Figure Data

Filename	Description
Fig3C	Matrix of the normalized intensities for Fig. 3C
Fig3D	Matrix of the normalized intensities for Fig. 3D
Fig3E	Matrix of the normalized intensities for Fig. 3E
Fig3F	Matrix of the normalized intensities for Fig. 3F
Fig3G	Matrix of the normalized intensities for Fig. 3G
Fig3H	Matrix of the normalized intensities for Fig. 3H
Fig4A	Matrix of the normalized intensities for Fig. 4A
Fig4B	Matrix of the normalized intensities for Fig. 4B
Fig4C	Matrix of the normalized intensities for Fig. 4C

6 References

[1] Sebastian Weidemann, Mark Kremer, Tobias Helbig, Tobias Hofmann, Alexander Stegmaier, Martin Greiter, Ronny Thomale, and Alexander Szameit,
Topological Funneling of Light, *Science* (2020) DOI: 10.1126/science.aaz8727