Research data for

Electro-mechanical light modulator based on controlling the interaction of light with a metasurface

Pablo Cencillo-Abad[1], Jun-Yu Ou[1], Eric Plum[1] and Nikolay I. Zheludev[1,2]

*[1] Optoelectronics Research Centre & Centre for Photonic Metamaterials,
University of Southampton, Highfield, Southampton, SO17 1BJ, UK*
*[2] Centre for Disruptive Photonic Technologies, School of Physical and Mathematical Sciences and The Photonics Institute,
Nanyang Technological University, Singapore 637371*

The data shown in the figures of the corresponding paper is given as csv files. Please refer to the paper for a detailed description.

Data shown in Figure 2

Filename	Location	Description
EPSRC_fig_2a.csv	Column 1	Wavelength in nanometers
	Column 2	Simulated absorption of a cavity composed of a gold mirror and an ideal lossy beam splitter for the incoherent case, where 1 corresponds to 100%
	Column 3	Simulated absorption of a cavity of 5485 nm length composed of a gold mirror and an ideal lossy beam splitter for the coherent case, where 1 corresponds to 100%
EPSRC_fig_2b.csv	Column 1	Wavelength in nanometers
	Column 2	Simulated absorption of the metamaterial, where 1 corresponds to 100%
EPSRC_fig_2c.csv	Row 1 from 2nd cell	Wavelength in nanometers
	Column 1 from 2nd cell	Cavity length in micrometers
	Matrix from (2,2) to (end, end)	Absorption of the metadevice in percent as a function of wavelength and cavity length

Data shown in Figure 3

Filename	Location	Description
EPSRC_fig_3a_top.csv	Column 1	Wavelength in nanometers
	Column 2	Absorption measured with 0 V voltage applied to the metadevice in percent
	Column 3	Absorption measured with 20 V voltage applied to the metadevice in percent
EPSRC_fig_3a_bot.csv	Column 1	Wavelength in nanometers
	Column 2	Simulated absorption for a cavity length of 5485 nm in percent
	Column 3	Simulated absorption for a cavity length of 5406 nm in percent
EPSRC_fig_3b_top.csv	Row 1 from 2nd cell	Wavelength in nanometers
	Column 1 from 2nd cell	Applied voltages in Volts
	Matrix from (2,2) to (end, end)	Measured absorption of the metadevice in percent as a function of wavelength and applied voltage
EPSRC_fig_3b_bot.csv	Row 1 from 2nd cell	Wavelength in nanometers
	Column 1 from 2nd cell	Applied voltages in Volts based on the voltage-cavity length relationship given in the manuscript
	Matrix from (2,2) to (end, end)	Simulated absorption of the metadevice in percent as a function of wavelength and applied voltage based on the voltage-cavity length relationship given in the manuscript

Data shown in Figure 4

Filename	Location	Description
EPSRC_fig_4a.csv	Column 1	Applied voltage in Volts
	Column 2	Fitted displacement in nanometers
EPSRC_fig_4b_left.csv	Column 1	Applied voltage in Volts
	Column 2	Measured absorption in percent at 1348 nm wavelength
	Column 3	Absolute standard deviation of the measured absorption
EPSRC_fig_4b_right.csv	Column 1	Applied voltage in Volts
	Column 2	Measured absorption in percent at 1586 nm wavelength
	Column 3	Absolute standard deviation of the measured absorption

Data shown in Figure 5

Filename	Location	Description
EPSRC_fig_5a_top.csv	Column 1	Time in milliseconds
	Column 2	Applied voltage in Volts (measured)
EPSRC_fig_5a_bot.csv	Column 1	Time in milliseconds
	Column 2	Measured absorption in percent as a function of time
EPSRC_fig_5b.csv	Column 1	Time in milliseconds
	Columns 2-7	Measured absorption in percent as a function of time for 100 Hz rectangular modulation of the applied voltage between 0V and different maximum voltages of 10V (column 2), 12V (col. 3), 14V (col. 4), 16V (col. 5), 18V (col. 6) and 20V (col. 7) as explained in the paper