

High-Performance and Self-Powered Visible Light Photodetector using Multiple Coupled Synergetic Effects

José P. B. Silva^{1,2,δ*}, Eliana M. F. Vieira^{3,4,δ}, Katarzyna Gwozdz⁵, Nuno E. Silva^{1,2}, Adrian Kaim⁵, Marian C. Istrate^{6,7}, Corneliu Ghica⁶, José H. Correia^{3,4}, Mario Pereira^{1,2}, Luís Marques^{1,2}, Judith L. MacManus-Driscoll^{8*}, Robert L. Z. Hoye⁹, Maria J. M. Gomes^{1,2}

¹Physics Center of Minho and Porto Universities (CF-UM-UP), University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal

²Laboratory of Physics for Materials and Emergent Technologies, LapMET, University of Minho, 4710-057 Braga, Portugal

³CMEMS – UMinho, University of Minho, Campus de Azurem, 4804-533 Guimarães, Portugal

⁴LABELS –Associate Laboratory, Braga, Guimarães, Portugal

⁵Department of Quantum Technologies, Wrocław University of Science and Technology, Wrocław 50-370, Poland

⁶National Institute of Materials Physics, 105 bis Atomistilor, 077125 Magurele, Romania

⁷University of Bucharest, Faculty of Physics, Atomistilor 405, Magurele Ilfov 077125, Romania

⁸Dept. of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Rd., Cambridge, CB3 0FS, U.K.

⁹Inorganic Chemistry Laboratory, Department of Chemistry, University of Oxford, South Parks Road, Oxford, OX1 3QR, UK

^δThese authors contributed equally to this work.

* Corresponding authors' e-mails: josesilva@fisica.uminho.pt and jld35@cam.ac.uk

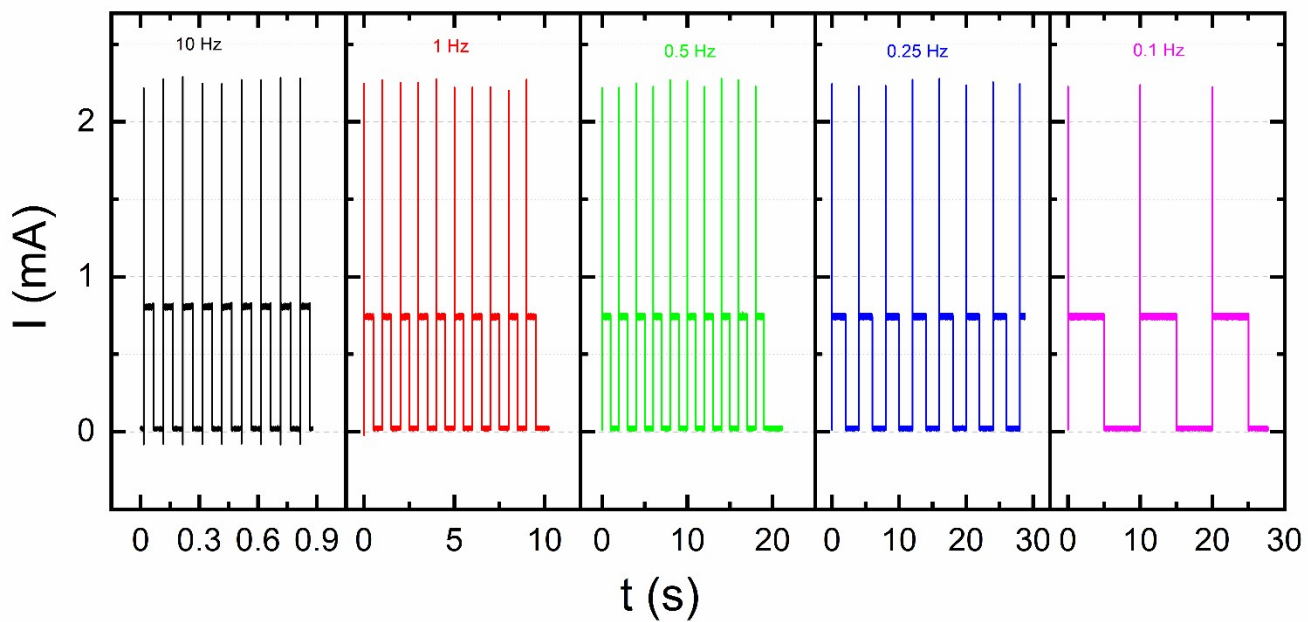


Fig. S1. I - t curves for the Ag@20 sample at different chopper frequency, in the range 10-0.1 Hz, for a fixed power density of 877 mW/cm².

Table S1. Dark current and photocurrent values obtained through I - V and I - t measurements, respectively for the different samples.

Sample	Dark current (nA)	Photocurrent (mA)
Ag@0	270	0.47
Ag@10	32.4	1.45
Ag@20	7.6	1.99
Ag@40	27.7	3.77
Ag@80	73.7	1.43
Ag@160	5.6	1.56