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Optical excitation and quenching of photocurrent in single-crystal diamond JESON CHEN[1], Department of Physics, Texas AM University, USA, SEAN LOURETTE, KRISTINE REZAI, PAULI KEHAYIAS, Department of Physics, University of California at Berkeley, USA, MICHAEL LAKE, Department of Chemistry and Biochemistry, University of California at Los Angeles, USA, ANDREY JARMOLA, Department of Physics, University of California at Berkeley, USA, MILOS NESLADEK, Institute for Materials Research (IMO), Hasselt University, Belgium, LOUIS BOUCHARD, Department of Chemistry and Biochemistry, University of California at Los Angeles, USA, PHILIP HEMMER, Department of Electrical Engineering , Texas AM University, USA, DMITRY BUDKER, Department of Physics, University of California at Berkeley, USA — Diamond has found important applications in optoelectronics including electron emitters, windows for high power devices, and x-ray photon detectors, thanks to its unique properties, such as a wide bandgap, high thermal conductance and broadband optical transmittance. It is thus of paramount importance to investigate the photoelectric properties of diamond in greater details. Here we report the observation of optical quenching of photocurrent in diamond using simultaneous illumination of pulsed and continuous wave lasers at the same wavelength and different wavelengths. The quenched photocurrent shows a recovery related to the external bias voltage, pulsed optical power and wavelength. The recovery of the quenched photocurrent provides information on the nature of the electron trap states in diamond.

[1]Current: Academia Sinica, Taiwan

Jeson Chen
Academia Sinica

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