ABSTRACT

Photonic device, a photonic system comprising the photonic device and a method of spectroscopic sensing using the photonic system

A photonic device is described in an embodiment. The photonic device comprising: a 2D material layer formed on a substrate; a source electrode and a drain electrode formed on the 2D material layer; and a plurality of nanoantennas formed on the 2D material layer between the source electrode and the drain electrode. Each of the plurality of nanoantennas having dimensions associated with a resonant wavelength of the photonic device and being configured to act as a non-centrosymmetric centre for providing anisotropy to generate a photocurrent in response to a polarized light incident on the photonic device, and the polarized light having a light wavelength near the resonant wavelength. The plurality of nanoantennas comprises one or more metal layers. The source electrode and the drain electrode are adapted to measure a photovoltage formed by the generated photocurrent, and a reduction in a magnitude of the photovoltage measured is used to detect a presence of an analyte having an absorption peak near the resonant wavelength of the photonic device. A photonic system comprising the photonic device and a method of spectroscopic sensing using the photonic system are also described.

[Figure to publish with abstract: Figure 1]