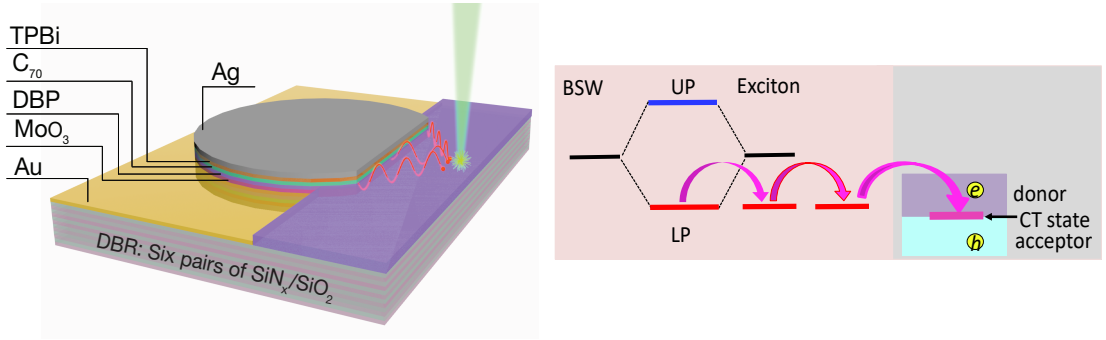
Photocurrent generation following long range propagation of organic exciton-polaritons

(a) (b)



(c) (d)

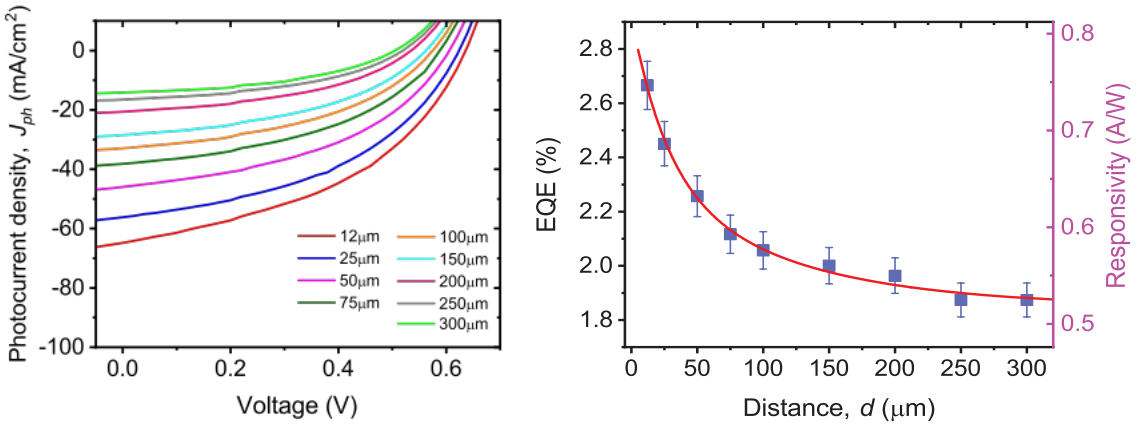


Figure: (a) Scheme of a device structure. (b) Illustration of the steps leading to photogeneration. (c) J-V characterization of the device. (d) Distance-dependent external quantum efficiency (EQE) and responsivity of the device.

Objective

➢ To achieve long-range polariton assisted photocurrent generation by utilizing the delocalization property of exciton-polaritons

Impact

All-dielectric photonic structure supports a Bloch surface wave (BSW) mode with strong electric field enhancement and very low optical loss, which is used to strongly coupled with organic excitons, giving rise to organic polaritons. With the low loss and delocalization properties, long-range energy transfer and photogeneration can be realized in organic electronic devices.

Facilities and Methods Used

- Plasma Enhanced Chemical Vapor Deposition
- Photolithography
- Vacuum Thermal Evaporator
- Fourier-Plane Imaging Microscopy
- I-V characterization Station

Relevant Papers

- B. Liu, X. Huang, S. Hou, D. Fan, and S. R. Forrest, Optica DOI:10.1364/optica.461025 (2022)

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