



## Are organic and hybrid photodetector ready for commercial products?

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■ Organic Photodetectors (OPDs) provide the opportunity to be easily and cost efficiently fabricated on large areas. Furthermore they experienced in the last years a successful development which culminated in several recent publications and press releases by renowned institutions. In particular the field of medical imaging could benefit strongly from the potential of the OPDs as reported recently by Gelinck *et al.*. Medical imaging requires large area X-ray detectors due to the limited ability to focus X-ray radiation and the relatively large area of the human body.

For X-Ray imaging it is typical to integrate on top of the photodetector matrix a scintillating material (e.g. CsI) which converts high energy radiation into visible light. This concept already reached a remarkable industrial maturity for detectors based on OPDs. These stacked approach however suffers inherently from the limited image resolution as photons are emitted isotropically from the scintillator. This optical cross-talk is the limiting factor in resolution of scintillator-based X-ray detectors.

An alternative and disruptive approach improving the resolution of such detectors by incorporating terbium-doped gadolinium oxysulfide ( $Gd_2O_2S:Tb$ ) scintillator particles into an organic bulk heterojunction (BHJ) based, photodetector matrix, will be presented. The X-ray induced light emission from the scintillators is absorbed within hundreds of nanometers in the BHJ, which is negligible compared to the gap between two neighboring pixels being in the range of  $10\mu m$ .