

Next Generation Optical Sensors for Gas & Vapour Detection

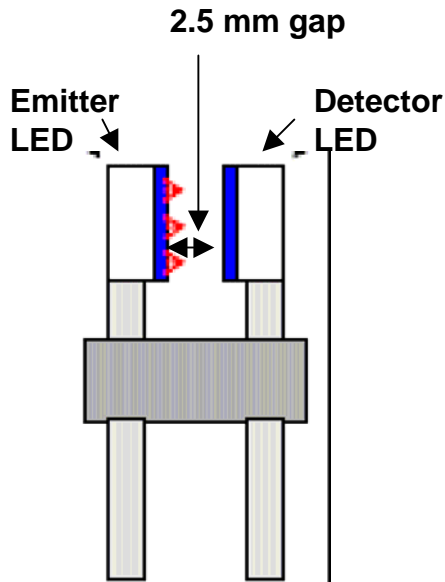
*Potential PERF/QUESTOR
Project*

The Issue

- **Increasing industry demand for:**
 - better, more specific and selective detectors for all **Health, Safety and Environmental Applications** e.g pipeline leak detection, LDAR programmes, workplace monitoring (fixed systems and personal exposure/alarm) etc.
- **Current sensor technologies are often:**
 - expensive
 - limited in selectivity
 - subject to various interferences.
- **Next generation optical sensors offer potential for:**
 - superior selectivity & sensitivity
 - easy integration with other technologies (e.g. wireless communication).
 - reliability, simplicity & low maintenance
 - low cost & versatility

Novel Approach

- **Target sensitive membrane coated onto LEDs selected to match absorbance of specific gas or vapour.**



LED sensor platform example developed in Dublin City University

- membrane changes colour in presence of target species; colour intensity is proportional to concentration.
- evaluation & optimisation will also include integration of wireless platforms.
- surface mount LEDs can be extremely compact, low cost, but very sensitive with potential scale up to use “sensor communities” to replace single very expensive devices.

Proposal

- **Deliverables:**

- Prototype optical sensing platforms for gases and vapours
- New membrane/coatings with unique colorimetric response properties
- Field demonstrations and applications of functional device

- **Principle Investigators:**

- Prof. Diamond & Dr. Lagunas; Dublin City & Queen's Universities.

- **Cost:**

- 140,000 Euro Total (for two linked 3 yr studentships)
- PERF/QUESTOR cost sharing - TBN