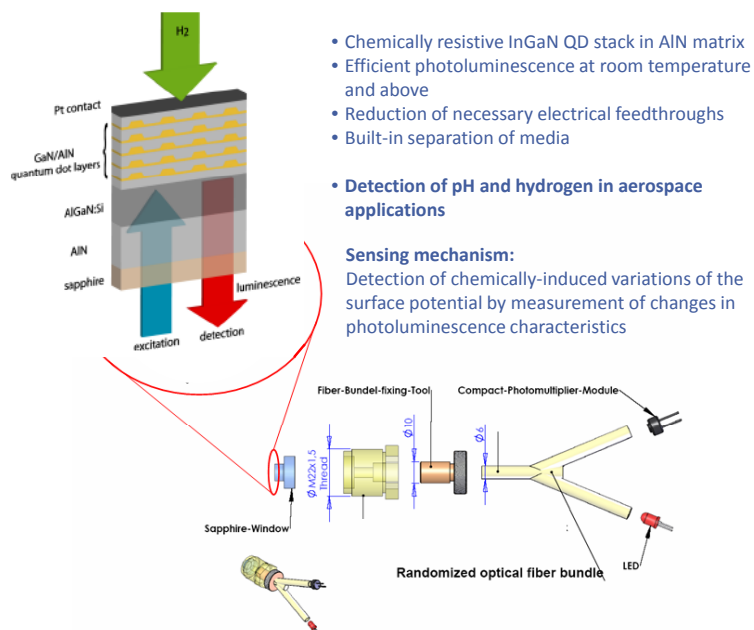


Chemical sensors based on III-nitride quantum dots as optical transducers (DOTSENSE) – FP7-ICT-STREP 224212

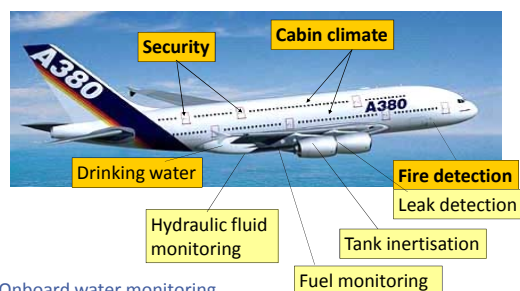


TARGET :

Development of nano-optical transducers based on (In)GaN quantum dots for chemical sensors operating in liquid and gaseous environment



DOTSENSE APPLICATIONS :



- Onboard water monitoring
- Hydraulic fluid monitoring
- Fuel- and hydraulic leak detection

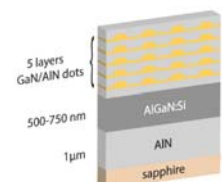
Multi-Parameter Hydraulic Fluid Sensor (Airbus specifications)

Mounting inside A380

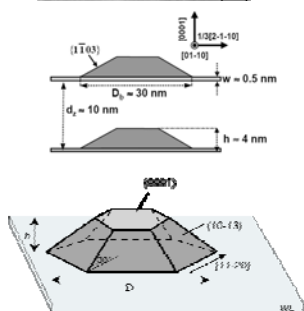
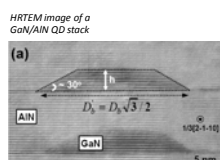
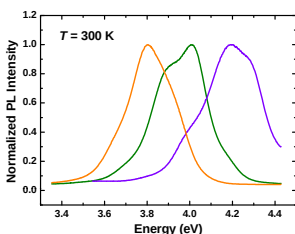


- Online measurement of:
- Water content
 - Total acidity number (TAN)
 - Chlorine content
 - Fluid conductivity
 - Particulate matter contamination close to hydraulics reservoir

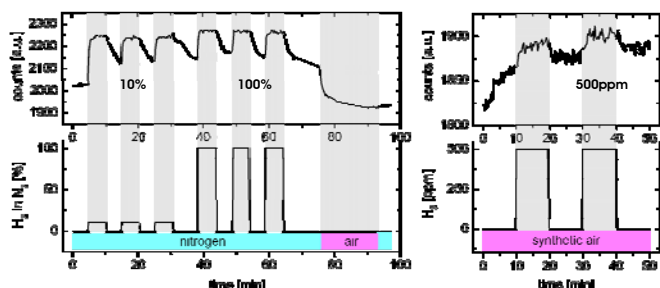
QUANTUM DOT TRANSDUCERS :



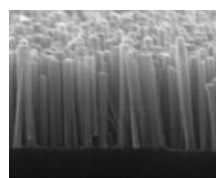
Growth by plasma-assisted MBE on AlN-on-sapphire templates



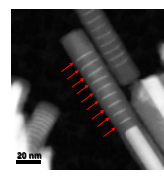
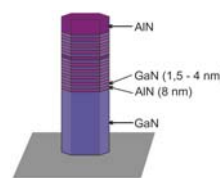
- PL peak energy tuneable in the UV/visible range
- Efficient photoluminescence at room temperature and above
- Optical detection of hydrogen by changes in PL intensity of GaN/AlN quantum dots



ALTERNATIVE TRANSDUCERS : NANODISKS



Growth by plasma-assisted MBE on Si(111) substrates



Z-contrast image
bright areas: GaN
Image: J. Arbiol, J.-R. Morante, University of Barcelona

- Growth of GaN / AlGaIn and GaN / AlN nanowires with embedded GaN quantum disks
- Emission energy can be controlled with
 - Al content in the barrier
 - Well thickness
- Intense emission
- Growth of nonpolar QWs on the sidewalls possible