

Trace Chemical Sensor for Robotic Ground Vehicles and dirty environment

A portable and rugged C sensor for RGVs, based on FAST Gas Chromatography and Quartz Enhanced Photo Acoustic Spectroscopy, suitable to detect and identify with trace sensitivity and fast response a wide range toxic compounds of higher and lower volatility, even in the presence of interferences like gasoline, detergents, and paints.

Size: < 45 x 40 x 20 cm;

Weight: < 10 Kg

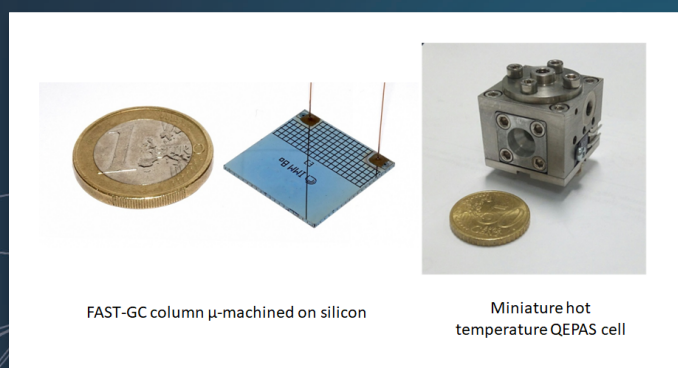
Targets: tested successfully with a variety of CWA simulants and drug precursors (DMMP, DPGME, Methyl Salicylate, safrole, ...)

Robustness: tested successfully with targets in the presence of higher concentrations of gasoline, gasoil, and paints

Detection range: tens ppb-1000 ppm

Sensing cycle-time: < 7 min

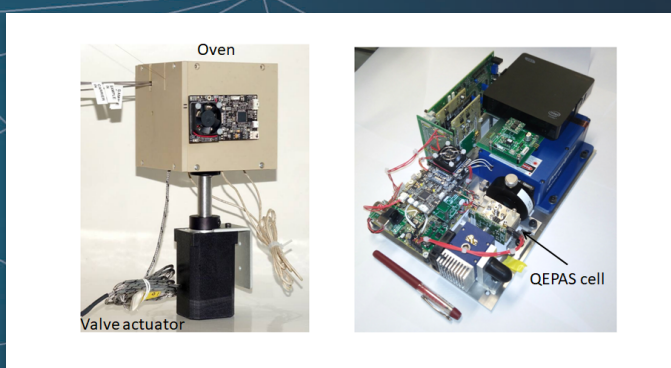
Warm-up time: < 10 min



FAST-GC column μ -machined on silicon

Miniature hot temperature QEPAS cell

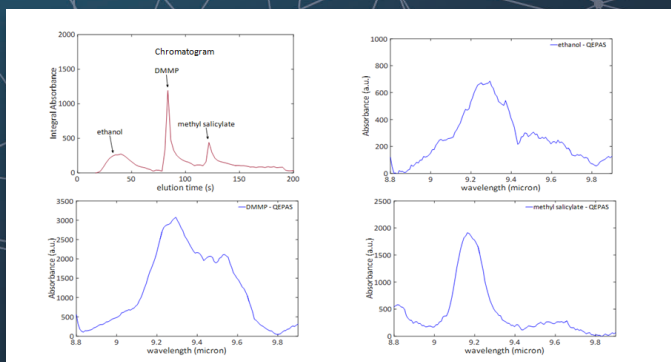
Miniaturized components



Modules for pre-concentration and FAST-GC separation (left), and for QEPAS analysis (right)



Trace C sensor prototype



Measured chromatogram and QEPAS spectra of a mix of ethanol, DMMP, and methyl salicylate