



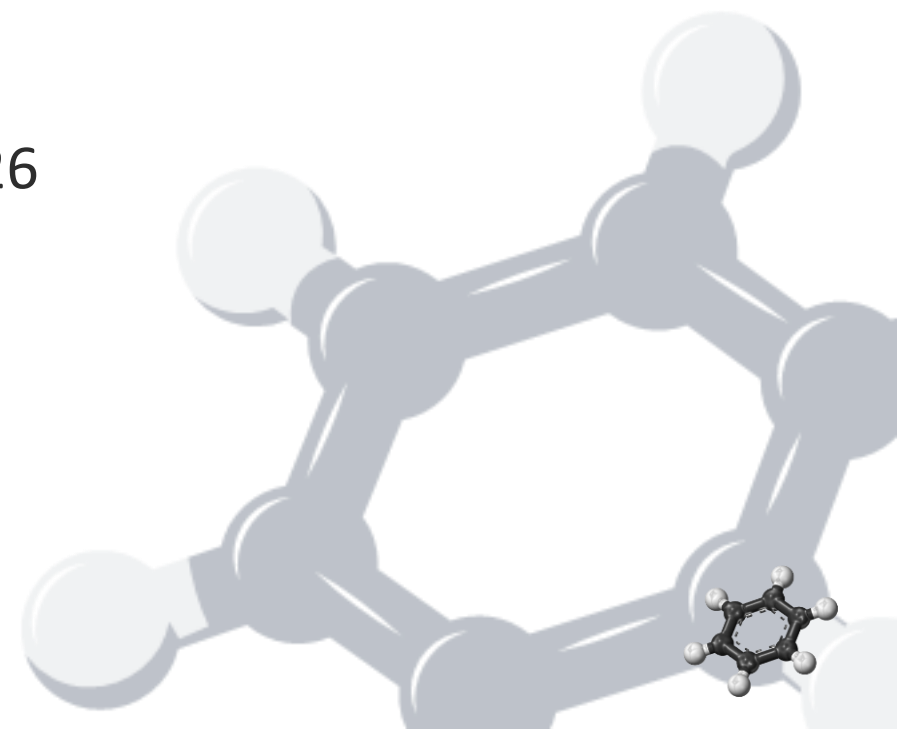
MION EVD (Explosive Vapor Detector) for Landmine/IED detection

Mine Action Innovation Hub

Innovation Technical Group (ITG) meeting, 28 May 2026

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Explosive Vapour Detection (EVD)

- Very high sensitivity – sub-ppq rage

Reaching a Vapor Sensitivity of 0.01 Parts Per Quadrillion in the Screening of Large Volume Freight

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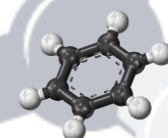


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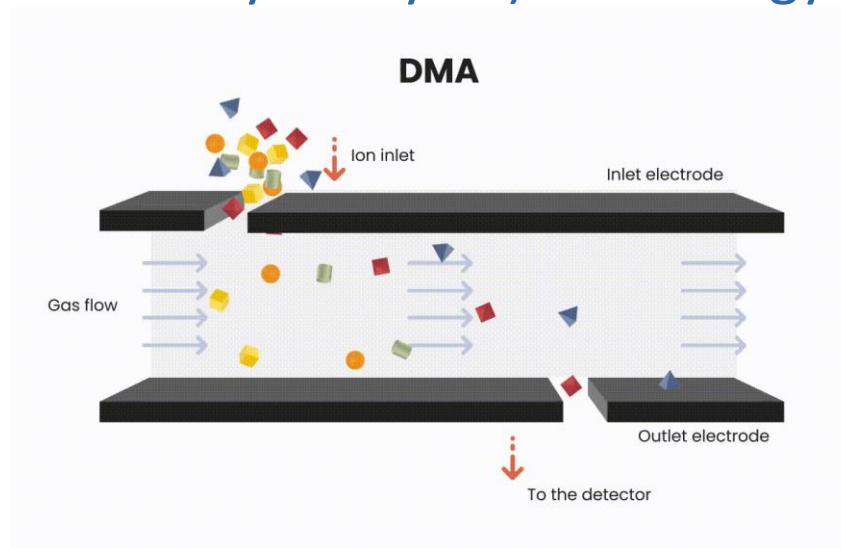
- Very high selectivity – Very low FAR (False Alarm Rate)
- Detection + identification + classification

MION's technology is the only technology worldwide under ECAC certification for Air Cargo screening

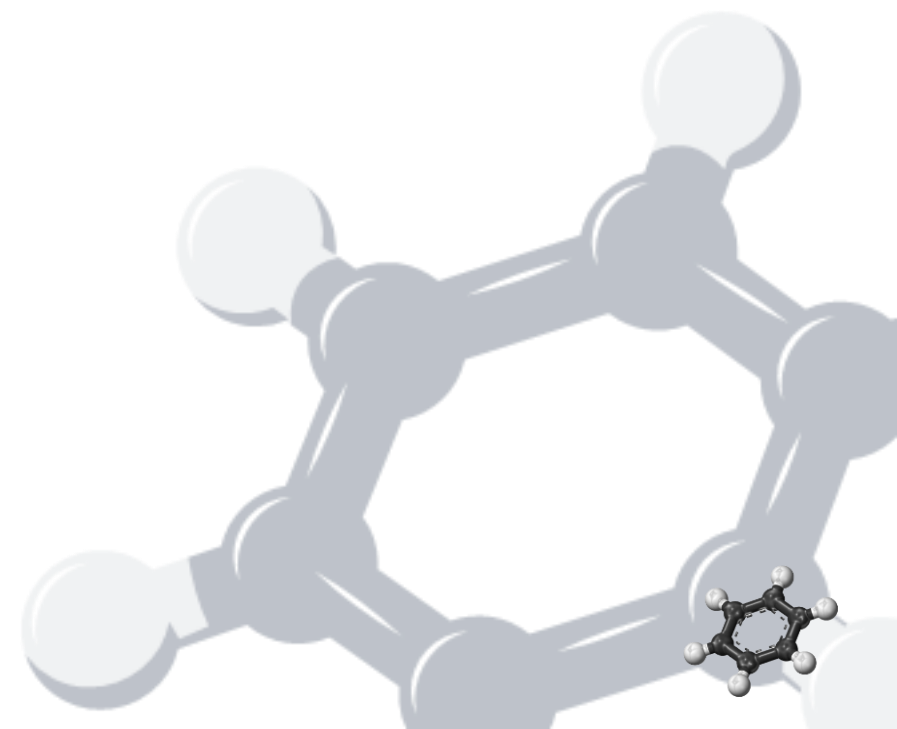


Explosive Vapour Detection (EVD)

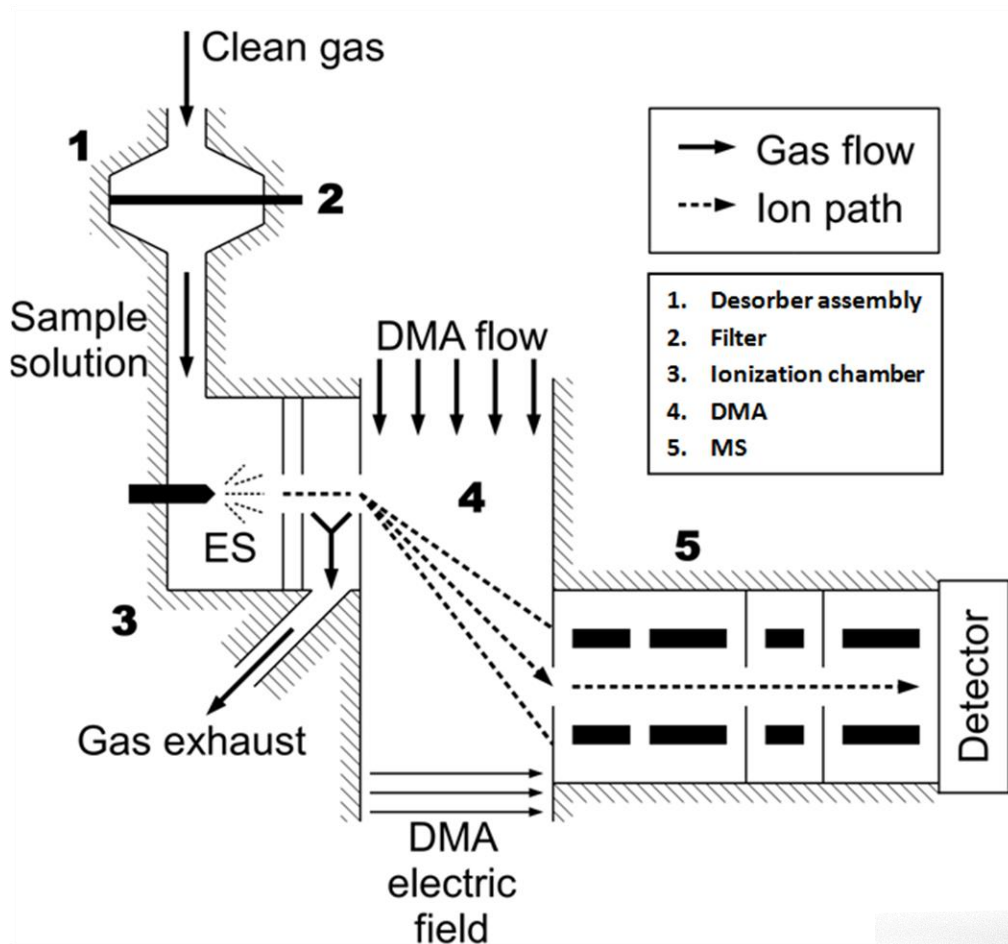
- DMA (Differential Mobility Analyzer) technology



- Two detection technologies available:
 - DMA – MS: ready at commercial level
 - MIONER-100: TRL6



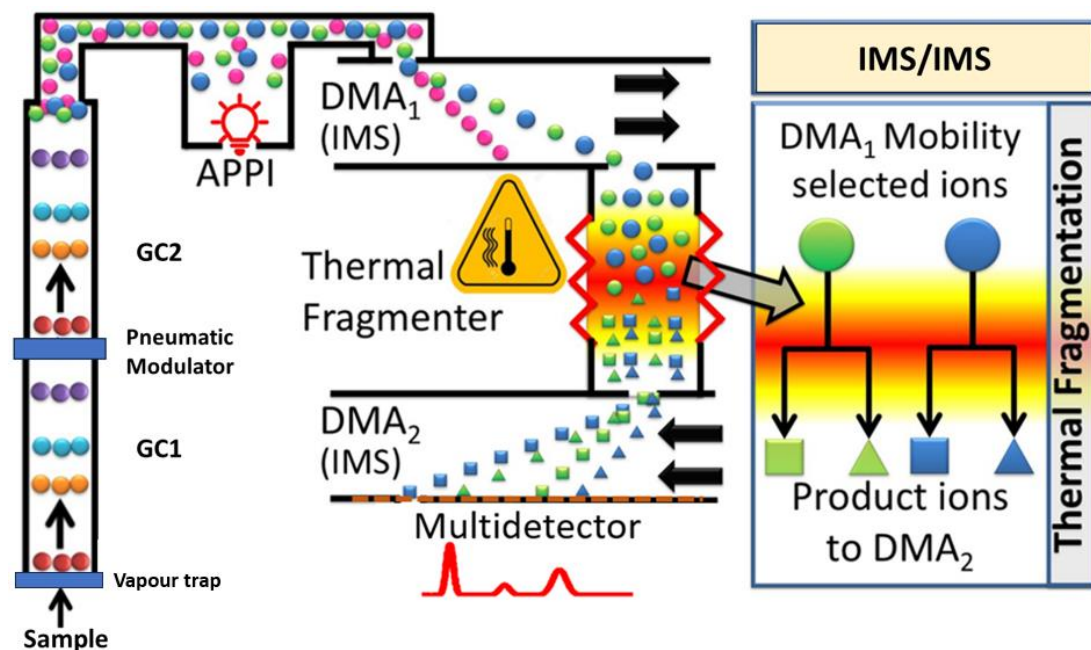
DMA-MS



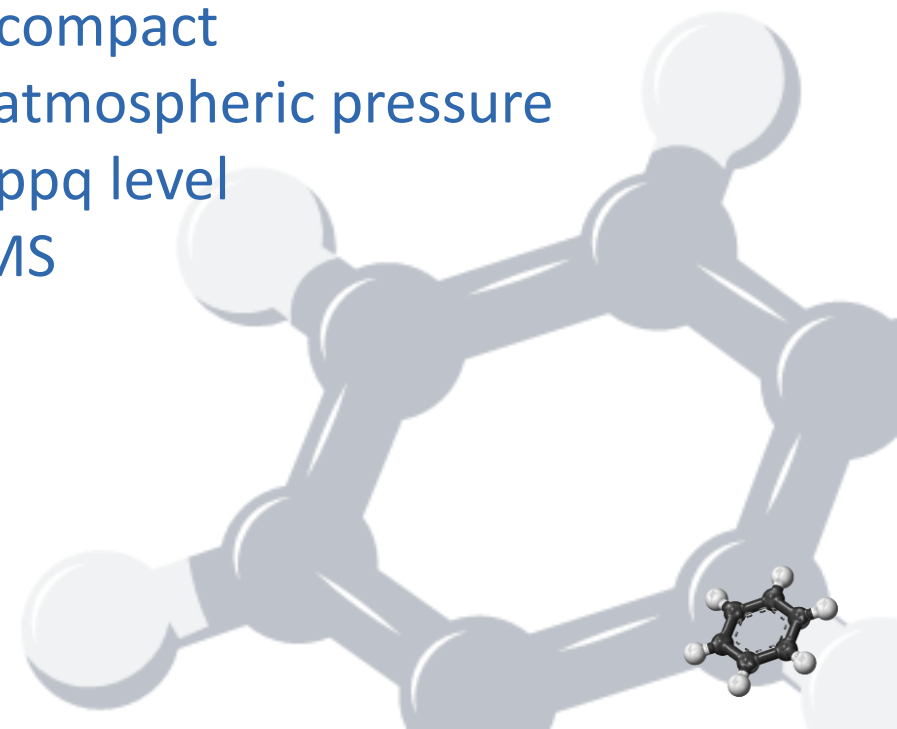
- Very high selectivity
- Bulky – MS is required
- At commercial level - VPSCAN



MIONER-100



- DMA + DMA with fragmentor
- CTIA fragments detection
- Portable and compact
- Operation at atmospheric pressure
- Sensitivity at ppq level
- No need for MS
- Still at TRL6

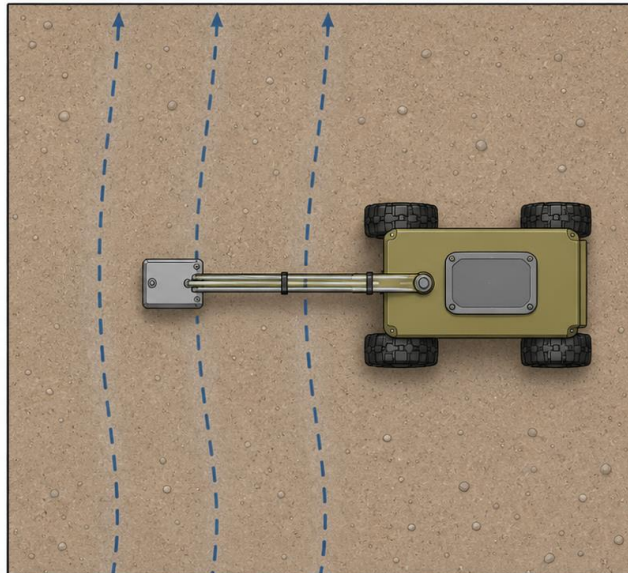
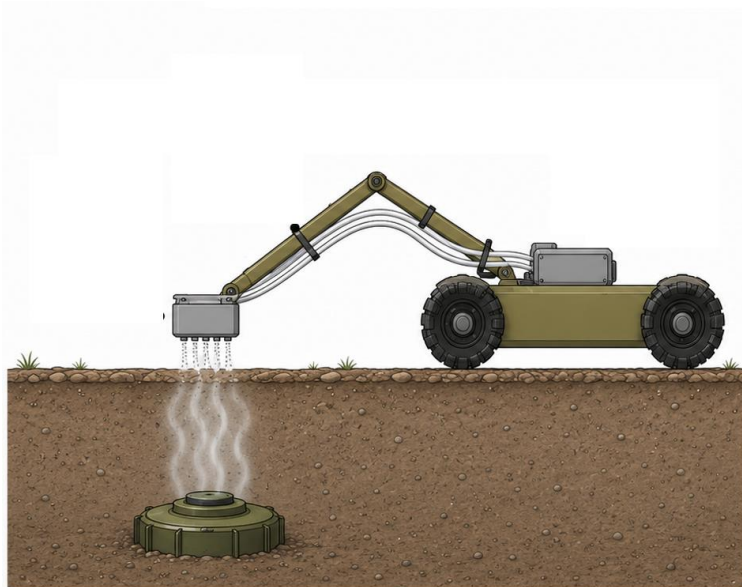




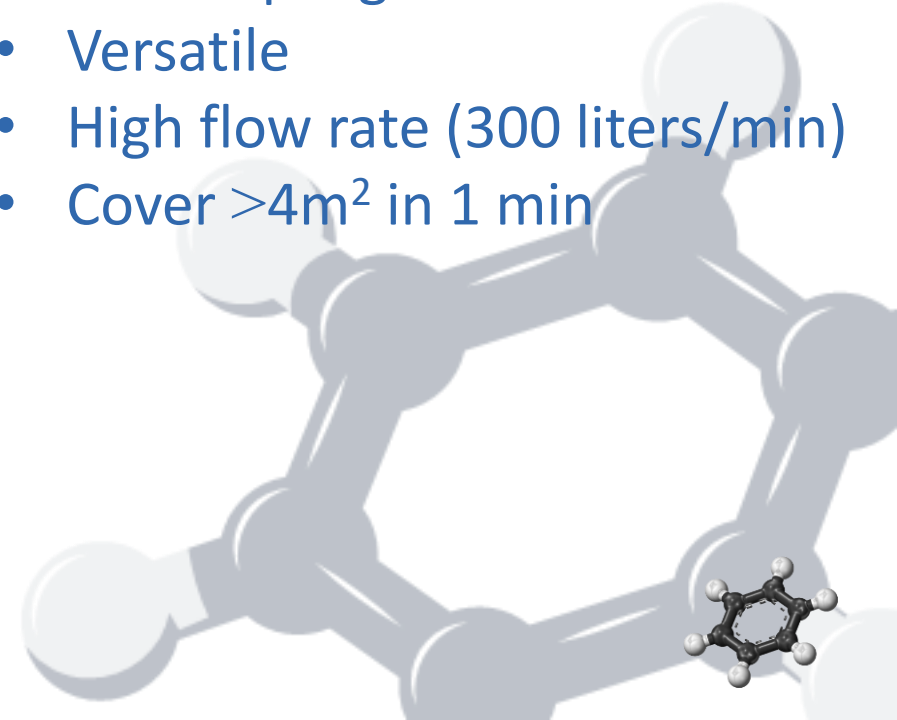
MION landmine detection concept

Screening process

- Vapour preconcentration + Analysis (2 steps)

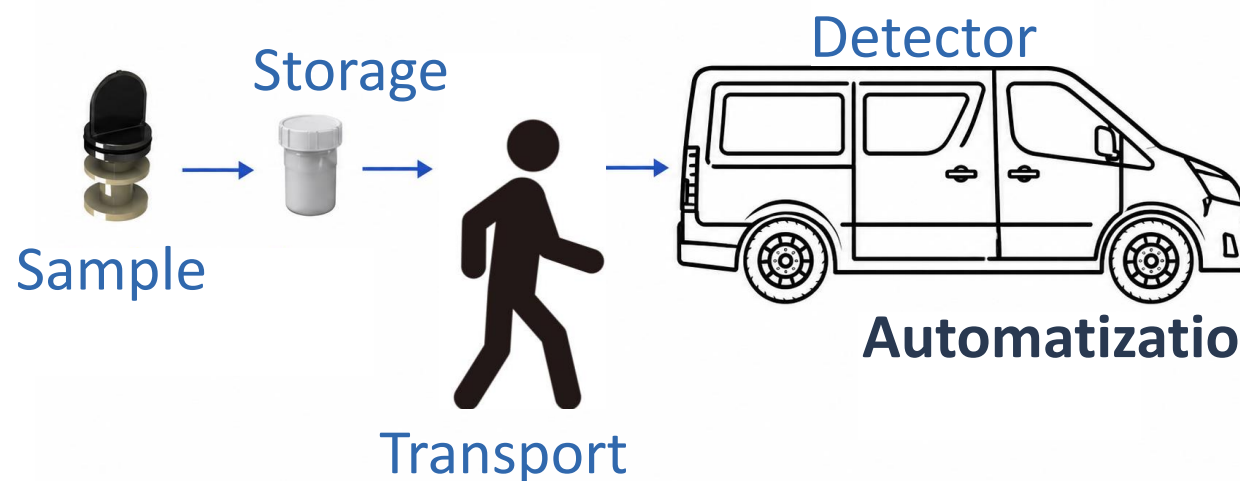


- Air sampling with UGV
- Versatile
- High flow rate (300 liters/min)
- Cover $>4\text{m}^2$ in 1 min

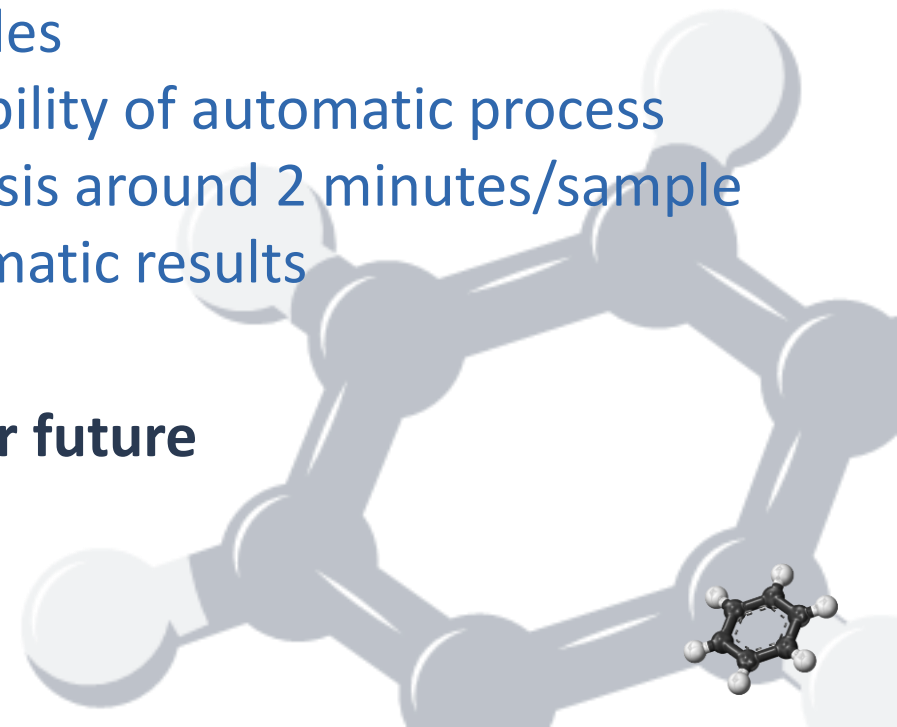


Screening process

- Vapour preconcentration + **Analysis** (2 steps)



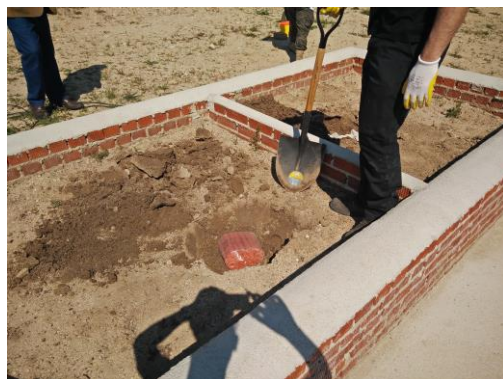
- Currently: Manual transportation of samples
- Possibility of automatic process
- Analysis around 2 minutes/sample
- Automatic results



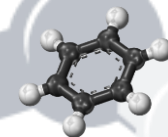
Experience and results



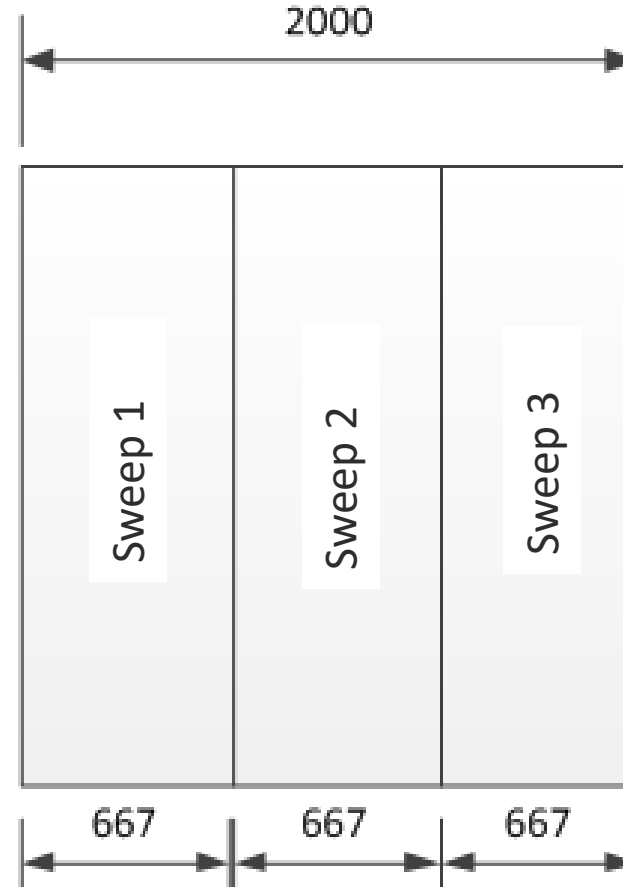
- Intensive testing campaign in collaboration with the **International demining center**
- Simulated scenarios



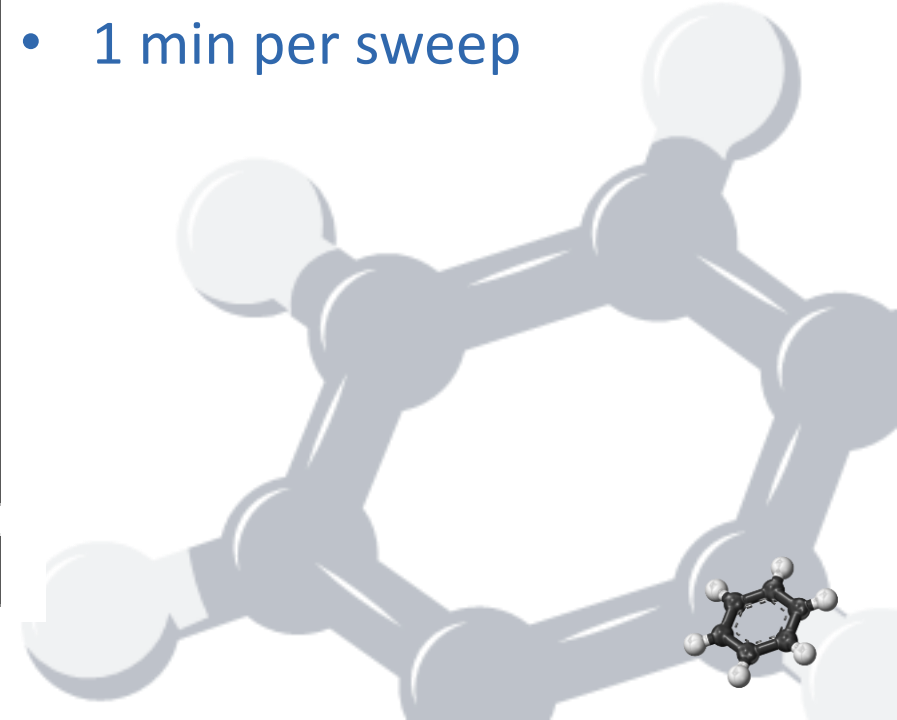
- 4 m² (2 x 2m) cells controlling: type of soil, different explosives, depth, etc
- 3 air sampling sweeps per cell

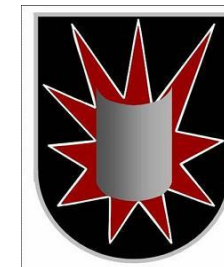


Experience and results

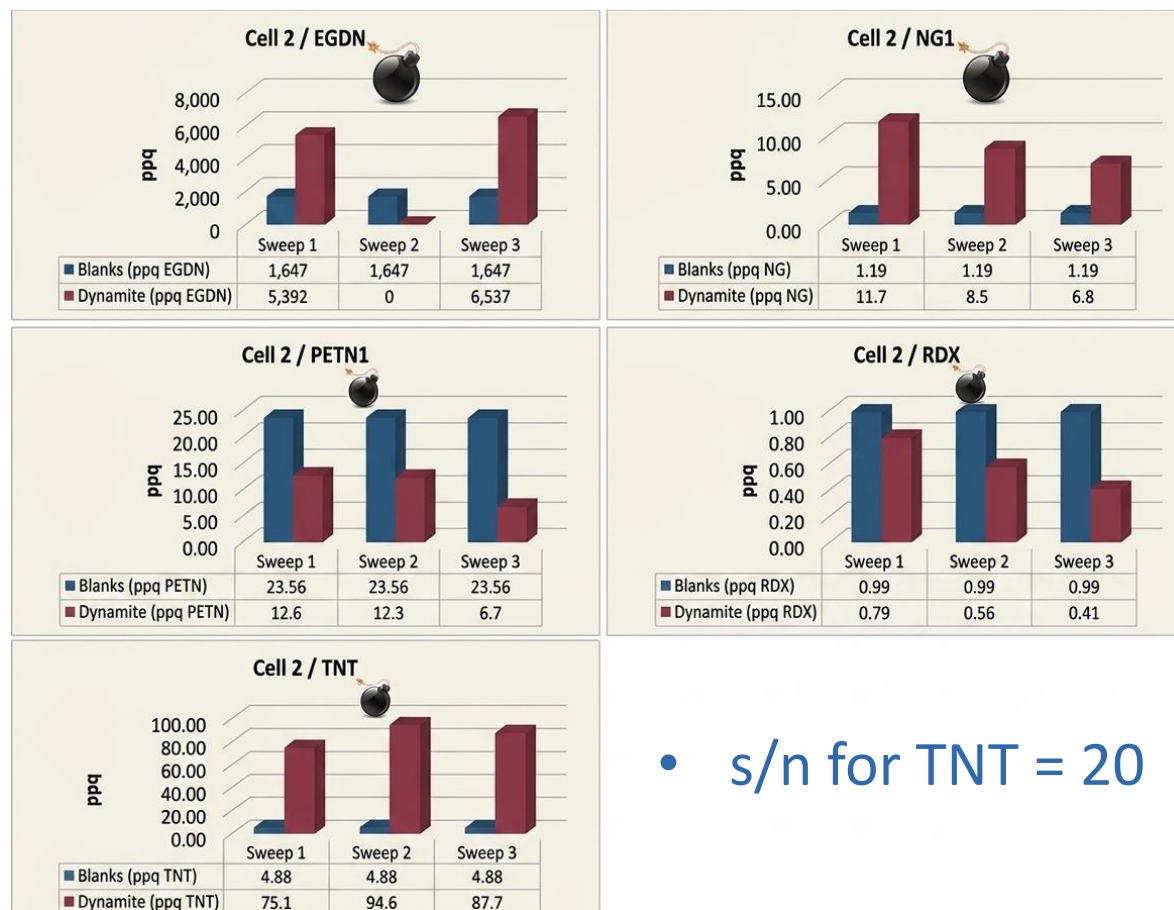


- 3 air sampling sweeps per cell
- 1 min per sweep



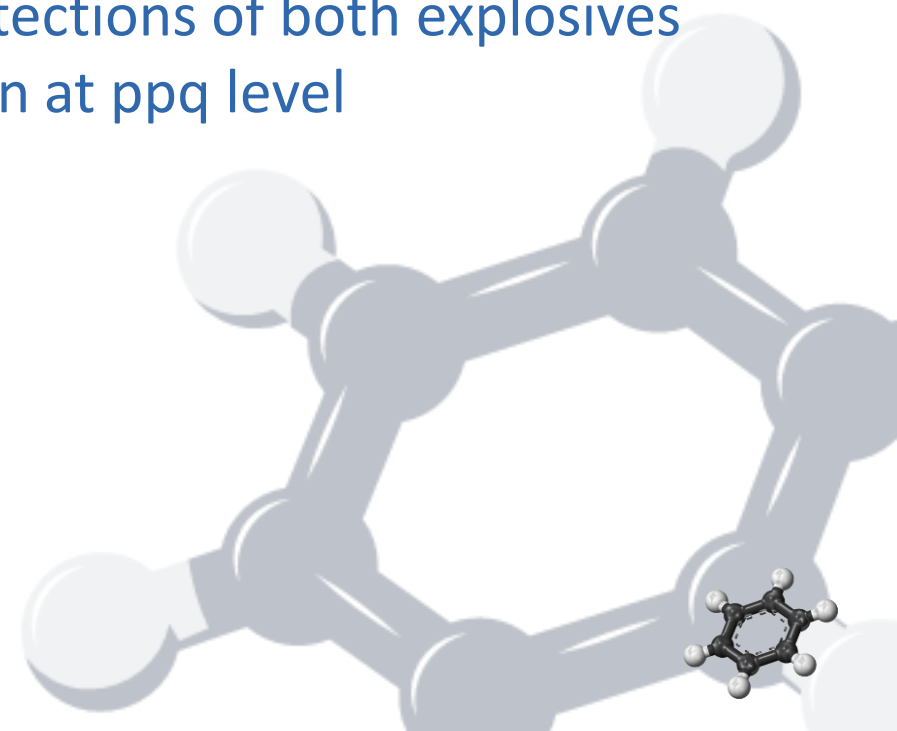


Experience and results



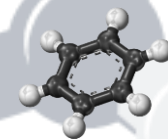
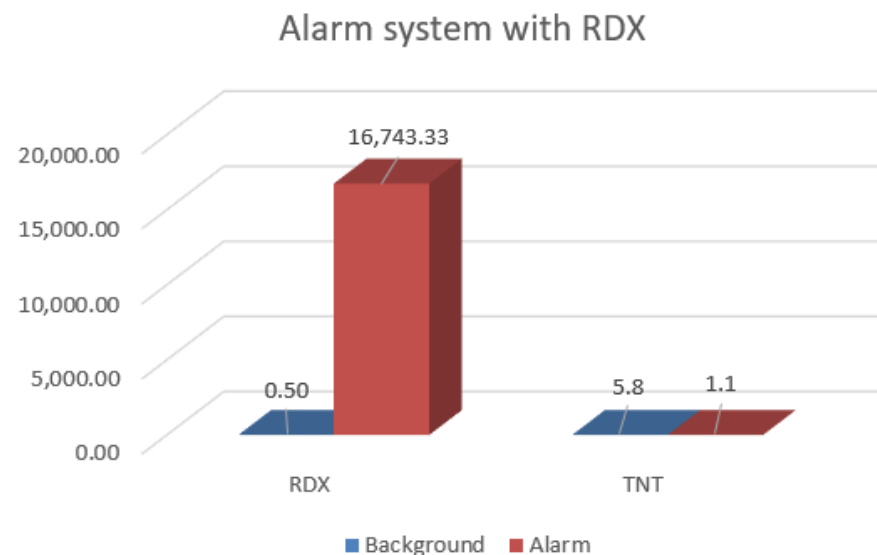
- Dynamite (NG + TNT)
- Placed in the second sweep
- Clear detections of both explosives
- Detection at ppq level

- s/n for TNT = 20



Experience and results

- TICHE-EDF project (<https://www.tiche-edf.eu/>)
- Combination with visual UAV-based technologies
- MION confirms and qualifies the threats
- Buried threats (landmines + IEDs) in a military Sweden Test Center (FOI)
- Detection in tracks
- Detection of a landmine based on RDX
- Buried 24hours before
- High detection of RDX
- Results are EU-R classified





MION Technology

Explosive Vapour Detection (EVD)

- MION is **looking for partners** to:
 - Continue the demonstration of the technology, specifically MIONER-100
 - Embarking the technology in UGVs
 - Combination with other “visual” technologies to provide a complete solution

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Thank You
For Your Attention

