

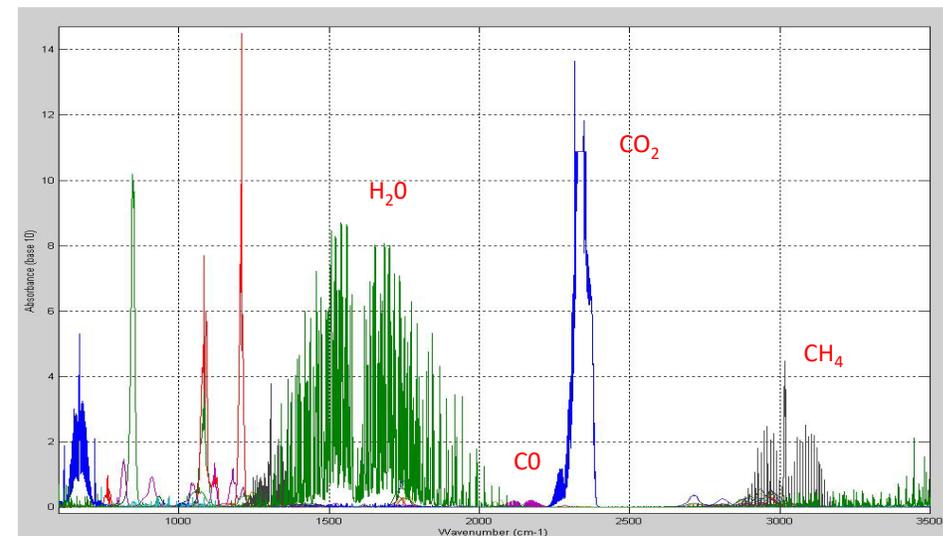


FTIR/ANITA: SHORT PRESENTATION

Atle Honne

FTIR for multi-gas measurement

- FTIR records **high-quality spectral information** with high resolution over a wide wavelength range in one measurement
- Multi-gas mixtures are still **difficult to analyse**, owing to spectral interference between gases, baseline drift, optical saturation, and non-linear response
- Using detailed knowledge of the response of the FTIR instrument, SINTEF has developed a **unique calibration technique** for solving these difficulties
- Provides a unique ability to perform multi-gas measurements with
 - High sensitivity
 - High specificity
 - High accuracy
 - High reliability



FTIR for multi-gas measurement – ANITA

- ANITA1 performed air quality monitoring at the ISS (International Space Station) in 2007-8
 - Quasi-continuous measurements
 - 31 trace gases with sub-ppm detection limits
 - Automatic detection of unexpected gases
 - ANITA1 revealed useful new information on the presence of trace gases and on trace gas dynamics in the ISS air
- ANITA2 will monitor the ISS air from January 2022
 - 37 gases
 - Further refined gas analyses
 - Demonstrator for exploration missions, Gateway (orbiting the Moon), Moon and Mars bases



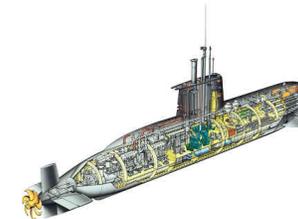
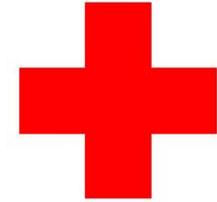
FTIR for multi-gas measurement

- Compared to GC and GC/MS, our FTIR measurements are:
 - Much more accurate and reproducible
 - Much faster, allowing inline measurements
 - Well suited for automatic measurements
 - Can measure most gases, including small molecules and reactive gases
 - No consumption of sample gas
 - Permanent calibration: Normally no need for re-calibration or calibration checking (Calibration for unexpected gases can be introduced as a software update)
- Compared to laser-based measurements, our FTIR measurements are:
 - Suitable for multiple gases in parallel
 - Suitable also for larger molecules like VOCs (Volatile Organic Compounds)

FTIR for multi-gas measurement

Multiple non-space areas of application, e.g.:

- Air quality monitoring:
 - Diving systems
 - Submarines
 - Airplanes
 - Hospitals
 - Laboratories
 - Environmental monitoring, industrial emissions, ...
- Industrial process monitoring
- Agriculture (emission of nitrous gases)





Teknologi for et bedre samfunn