

Greenhouse gas monitoring at the Mullard Space Science Laboratory (UCL Australia)

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What we have done so far.

- Demonstration of imaging in the Visible and NIR using both Liquid Crystal Tunable Filters (LCTF) and Acousto-Optic Tunable Filters (AOTF) technologies in front of small format CCD cameras and EMCCD cameras.
- Assessment of retrieval of Methane data from existing spacecraft ACE/FTS and GoSAT.
- Simulations of observation scenarios (for different COTS technologies) using Radiative Transfer Models (MODTRAN, SCIATRAN); focussed on $1.67\mu\text{m}$ and $2.2\mu\text{m}$

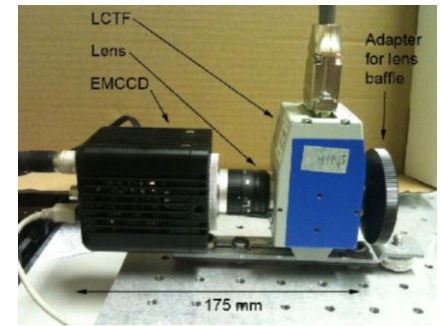


Image courtesy of JAXA

Future Research at MSSL

- Developing a lab prototype, with internal funding, of a new hyperspectral instrument to generate wide FoV images of up to 0.02nm spectral resolution
- Eventual aim is to apply Fabry-Perot etalons or AOTF technology to image isotopologues of $^{12}\text{C}/^{13}\text{C}$ in CH_4 and CO_2 for source apportionment
- Long-term goal is to develop a stationary HAP (High Altitude Platform)-based system which stares down from 20-35km altitude imaging leaks for monitoring or moves slowly across Australia conducting regular surveys for seeps and leaks
- Such a HAP-based system could include a full instrument suite of mapping and line-of-sight sampling