

SWING-UAV: Small Whiskbroom Imager for atmospheric compositioN monitorinG from an UAV

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Primary Objective:

Surface mapping of tropospheric NO₂ at spatial resolution of 200x200m

Instrumental concept:

Whiskbroom scanner with a compact grating spectrometer on an UAV, spectra analyzed with the DOAS technique

Applications:

Subsample satellite pixels

Validation of air quality models



*from Sabins, Jr., F.F., Remote Sensing: Principles and Interpretation, 2nd Ed., W.H. Freeman



Simulations using the NO2 field of a high resolution from an air quality model over Antwerpen (Belgium) :

- integration time for each positon of the scanner determined by the pixel size, altitude, and speed of the aircraft
- Initial noise level derived from a previous airborne experiment with the same spectrometer (Merlaud et al., AMT, 2012)

Payload technical details

- 750 nm, resolution 1,5 nm









Aircraft technical details

-custom –built by Reev River Aerospace

-2.5 m wingspan

-speed: 60 km/h at 3 km altitude

-autonomy: 2 hours

Conclusions and Perspectives

- Test flight from the UAV planned in early 2013



-SWING payload built and survived several ultralight test flights

-Scanning loop has to be optimized